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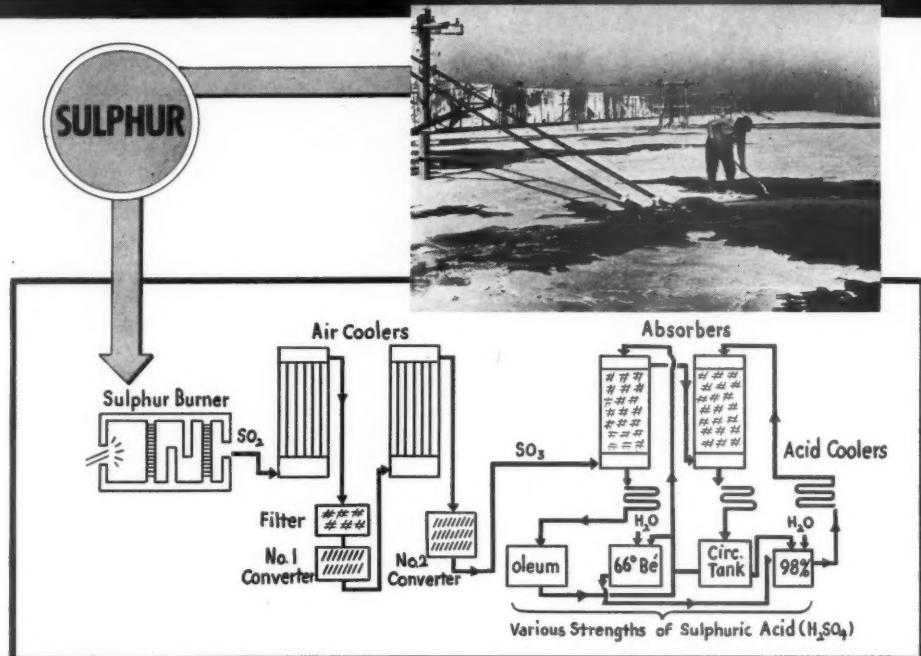
Pulp & Paper

INDUSTRY

Vol. 16 • No. 7

JULY • 1942

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{Contact Process}

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**Pacific
PULP &
PAPER
Industry**

*The Journal of the
Pacific Coast Industry*

JULY • 1942

Vol. 16 — No. 7

▼
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Prospects For Paper

by A. W. AKERS*

SINCE this war began, events have been making fools of all experts who have dared to make any prediction on any subject, and if this has happened to experts, what is likely to happen to an ordinary paper peddler like myself, who dares talk about the prospects for anything, or make any prediction on any subject whatsoever.

First, what about this paper shortage, of which we heard so much just a few months ago? It is perfectly evident now that there was no shortage, although such was predicted by all grades and manner of experts, experting, of course, in the best of faith. They arrived at their predictions of shortage by calculating coming Government requirements, and superimposing this on past civilian requirements, to which they also added the requirements of some of our Allies, who had formerly been supplied from the European and Scandinavian countries. The resulting figures were greatly beyond the productive capacity of our country. Hence the dire predictions for the future.

The immediate result of these predictions was tremendous forward buying, by everyone, and a backlog of orders began to accumulate in the distributors and manufacturers' hands, and for a moment the experts were able to say "I told you so," and to announce that the shortage was upon us.

What had not been taken into consideration, however, was the fact that a great deal of Defense, or rather, War, paper requirements were not actually being superimposed upon past civilian demands; but that a large portion was a diversion. In other words, while aircraft, tank, and gun factories, as well as shipyards, required enormous amounts of paper, the requirements of the automobile, washing machine, typewriter, radio, and other peacetime factories, declined as rapidly, if not more so, than the War industries' demand increased. The demand for salmon cases for Lend-Lease, and/or War use, was enormous, but the requirements of cases for civilian consumption were correspondingly less.

In addition, former Allies, such as the Philippines, Dutch East Indies, and others, whose paper requirements were large, and who expected to obtain their requirements from the United States, now need no paper, at least from us.

The result of these factors was that those who had been ordering hand over fist, suddenly found that all their available storage space was occupied with paper, and that there was no paper shortage. Buying began to be restricted, and for some time now, paper production in this country has been considerably ahead of paper orders, simply because it is quite expensive to shut down a paper mill. But already this is becoming necessary, and many mills are now being operated far below capacity, being shut down several days a week.

Add to this the fact that many merchants, not knowing paper was plentiful, or for other reasons, were asking their customers not to get their packages wrapped, or to bring back empty bags, or cartons, for reuse.

The American does cooperate when he feels that certain things are patriotic, and if he felt it was of assistance in prosecuting the War, he or she was perfectly willing to go home carrying a dead fish by the bare tail.

This went so far that I found even my wife, who knows better, saving used and dirty paper bags, and not to put garbage in either.



A. W. AKERS Spoke on
"Prospects for Paper"

*Manager, Seattle Division, Zellerbach Paper Co., Division of Crown Zellerbach Corp. Talk given by Mr. Akers before the Washington Newspaper Publishers' Association convention in Seattle, June 20, 1942.

Predictions of a paper shortage were arrived at "by calculating Government requirements, and superimposing this upon past civilian requirements, to which they also added the requirements of some of our Allies, who had formerly been supplied from the European and Scandinavian countries. The resulting figures were greatly beyond the productive capacity of our country. Hence the dire predictions for the future. . . ."

"What had not been taken into consideration, however, was the fact that a great deal of Defense, or rather War, paper requirements were not actually being superimposed upon past civilian demands; but that a large portion was diversion."

There have been and are some dislocations, but not shortages. By this I mean some paper items may not be immediately available, due to unbalanced inventories, while there are six months' stocks of other items, but this has always been true.

This is not the place to solicit any business, but when you return home, and go into a store, and the store-keeper tries to give you a bunch of onions to carry home by their ends, you ask him to put them in a bag, and if he tells you there are no bags, or that bags are scarce, you send me his order, and I will promise to ship him a million bags in two hours.

I know of no quicker way to demonstrate that up to now there has not been a paper shortage than to point out that when the priority system was set up, a list of critical materials was also set up; this list being composed of those materials which were short, and on which the production was not equal to the demand.

Paper was not on this list, and was never placed on this list. Consequently, it has not been possible for anyone to give you a priority for the purchase of paper, for paper was obtainable without any priority.

Suffice it to say that there is at the present time no paper shortage, and none foreseeable in the near future.

Potential Adverse Factors

- Insofar as productive capacity is concerned, no shortage is foreseeable at all. There are, however, three factors which over the long pull may bring about a shortage. The first of these is that many critical materials are used in operating a paper mill. These are motors, copper, wire, rubber, steel, etc.

As such equipment in paper mills wears out, and replacement parts and materials are scarce or not available, it is not only possible, but en-

tirely probable that paper mills will only be given the necessary priority assistance to produce paper in quantities which the Government may consider is required for War purposes, and essential civilian needs. My own personal opinion, for what it is worth, is that in case of a protracted war, eventually a shortage of paper for what may be considered non-essential purposes may develop, but not soon.

Even then, there are offsetting possibilities. Paper mill engineers are ingenious. Before stainless steel was developed, and before rubber piping was used, much wood pipe for acids was employed. It could be again, or possibly other substitutes developed. In other words, it is not impossible that in spite of shortage of critical materials, ways will be found to keep paper mills operating.

Another possibility which may bring about a shortage is, of course, the question of a transportation shortage. If cars are not available to haul paper away from the mill, it is of no more use to have plenty at the mill than it is to have plenty of gasoline in Texas.

I know very little about the transportation business; about railroad capacities, or possible car shortages, and I would be worse than a fool if I ventured any opinion on this subject. However, I presume you here are most interested in the possible effect on your own business, and it might be well to remember that the different grades of paper produced

in the State of Washington by the various mills here, are sufficient so that we could find something produced locally, which in a pinch would take care of our requirements.

The third possibility which could cause a shortage would be a Government order limiting the production of paper. Such orders have been issued affecting other industries, and in case it is felt that too much manpower or too much electric power, is being used in the production of non-essential papers, such a limiting order might be issued. However, it is not likely that such an order would affect paper generally, but it is more likely that only certain papers considered non-essential would be effected.

To summarize this situation, there is no paper shortage now, and there has not been one as yet. Shortages are only likely to develop because of lack of critical materials for operating paper mills, or lack of transportation, or a possible limitations order by the War Production Board. There is no shortage likely in the near future, and none likely at all of essential papers.

I am now out on the limb, and I presume events will promptly start sawing, and I hope if and when I see you a year from now, that you won't do anything more than laugh out loud.

"If It Were Only True"

- This is the head of an item in the Daily Mill Stock Reporter, New York, June 30th, which indicates the present plentiful supply of waste paper in the metropolitan area. The news story goes on:

"If it were only true," sighed the waste paper dealer as he read the following from this week's issue of the Paper Trade Journal:

"Fire, June 17, destroyed a large storage building used for waste paper service at the plant of the Kieckhefer Container Company, Delair, N. J., manufacturer of board. The structure was located at the foot of Derousse avenue, fronting on the bank of the Delaware River, and contained about 1,000,000 tons of waste paper. An official estimate of the loss has not been announced. It is planned to rebuild."

The "1,000,000 tons" likely was 1,000,000 pounds.

Mr. Akers summarizes the paper situation: "There is no paper shortage now, and there has not been one as yet. Shortages are only likely to develop because of lack of critical materials for operating paper mills, or lack of transportation, or a possible limitations order by the War Production Board. There is no shortage likely in the near future, and none likely at all of essential papers."

Misunderstanding Threatens Steady Work In Paper, Paperboard and Packaging

Central Fibre Products tells employees and stockholders of dangerous effects of over-emphasis on economy in the use of paper and paperboard.

● The dangerous effects on health, sanitation and employment by misapplication of the Government's drive to save waste paper and economize in the use of paper and paperboard, is emphasized in a statement by the Central Fibre Products Company sent to stockholders and attached to each payroll check. Central Fibre Products, with head offices in Chicago, is a large producer of paperboard, having six plants with a capacity of 530 tons per day, located at Denver, Colo., Quincy and Mt. Carmel, Ill., Hutchinson, Kans., Tama, Iowa, and Vincennes, Indiana. The statement follows:

Steady Employment In All Paper, Paperboard and Packaging Lines Is Threatened By Misunderstanding

"You have read and been told that there is a shortage of paper—boxes, containers, bags, etc.—all forms and grades. This widespread appeal to save paper was started from the Government's appeal to the public to save WASTE PAPER in order to avoid a shortage of the finished paper products.

"Waste paper is now being saved in sufficient quantities to permit mills to run full with a capacity large enough to supply all war and civilian needs, but because some manufacturers, jobbers, and merchants everywhere saw an opportunity to twist the meaning of the Government's appeal and turn it to their own selfish benefits, mills are reduced to part time operation, there is no outlet for the accumulations of waste paper, thousands of men are thrown out of work, breakage of merchandise due to improper packaging is increasing rapidly, and health and sanitation throughout the nation are threatened.

"There is no shortage of paper or paper articles, and a patriotic duty will be filled by insisting upon proper packaging of all purchases. Accept no purchase not properly wrapped and boxed in new materials. Do not accept used, unsanitary, wasteful packaging materials.

"This nation is at war, and two of the most vital elements in winning that war are:

1. Guarding the health of the entire population.

2. Avoiding breakage and waste of critical and valuable merchandise and material."

Insist Upon Proper Packaging In New Materials

Said C. E. Carey, executive vice president, "We feel that all members of our industry should similarly publicize the facts regarding paperboard and paperboard products."

Army Reported Second Largest Paper User

● The United States Army yields only to the newspapers as the largest buyer of paper in the world, according to Captain R. B. Hamilton, in charge of paper procurement at the Army's quartermaster depot in Jersey City, N. J. "It's taking about 250,000 tons of paper and paper products per year to supply the Army needs now, and this figure will be increased with subsequent Army expansion," the officer said.

Among the minor items on the list mentioned were 21,553,000 memo pads.



Men of the PUGET SOUND PULP & TIMBER CO., mill at Bellingham decided to have their own scrap rubber depot. The drive, under the direction of Resident Engineer, HAROLD D. CAVIN, produced several tons of scrap, filling the bin in two days.

All proceeds from the sale of the scrap have been donated to the American Red Cross.

Conservation and Substitution Practices

No. 4—Steam Turbines, Steam Piping, Fittings and Valves

by O. T. DEFIEUX

Steam Turbines

- The complex nature of the research and development work which has been required to produce the modern steam turbine precludes the application of substitute materials by operating personnel.

Therefore this article will be confined to a consideration of operating problems and recommendations which will tend to conserve the life and increase the availability of this class equipment.

The primary factors of turbine operation are reliability, continuity, capacity, and economy. A brief review of the major items which affect some or all of these factors is as follows:

- (1) Lubrication: Failure to provide correct lubrication may result in costly shutdowns requiring the extensive use of critical materials to recondition the equipment for service.

The problem of turbine lubrication may be broken down into three definite phases:

- A. "Selection of the Lubricating Oil."

- B. "Care of the Lubricating System."

- C. "Testing and Maintenance of Records."

Early in June The American Paper & Pulp Association began the issuance of a series of four-page bulletins on Conservation and Substitution practices. They are compiled in cooperation with TAPPI and the American Pulp & Paper Mill Superintendents Association.

No. 4 in the series, issued at the end of June, was prepared by O. T. Defieux, Superintendent of the Steam Plant, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Camas, Washington.

The first bulletin by Vincent F. Waters of TAPPI dealt with Rubber Transmission Belts, Conveyor Belts, V Belts and the Salvage of Rubber Beltting. No. 2, by F. E. Bahrenberg, Strathmore Paper Co., covered Motors and Generators, Electrical Control Equipment, Electrical Wiring, Transformers, Fuses and Storage Batteries. No. 3, by George D. Bearce, Maine Seaboard Paper Co., presented ideas on Conveyors, Chains and Cables for Handling Pulpwood; Grinders, Burrs, Lathes and Accessories.

A. Selection of Lubricating Oil

- It is generally conceded that all steam turbine lubricating oils should be derived from parafin base crudes.

Operators should request the manufacturer of the turbines to provide specifications of suitable turbine oils.

If turbine oils containing rust in-

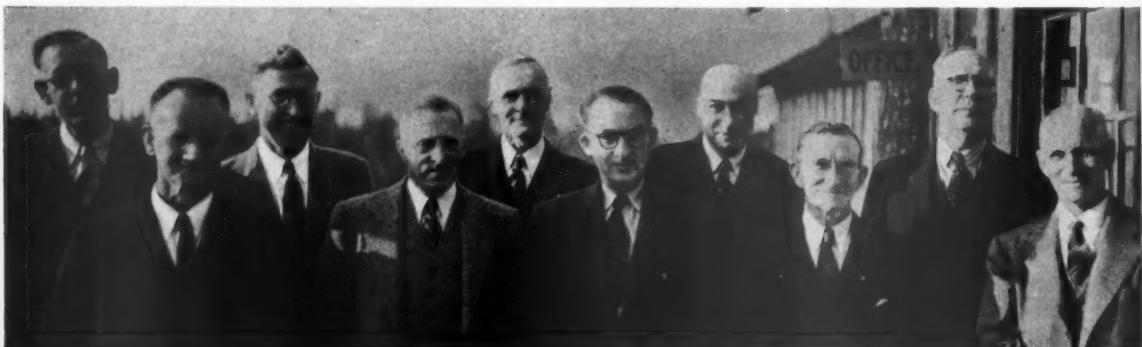
hibiting agents are selected, it is important to maintain the oil at a much lower neutralization number throughout its service life.¹

¹ "Lubrication of General Electric Steam Turbines," General Electric Company.

B. Care of the Lubricating System

- Prevent water entering oil by gland or oil cooler leakage. Cloth-type filters or centrifugal separators should be used individually or collectively to prevent accumulations of water, sludge or emulsions in the system.

Inspection and cleaning of such purifying systems should be on a routine schedule. Where numerous prime movers and auxiliary turbines are serviced by one oil purifying system, often one of the auxiliary turbines is the cause of the greatest percentage of the contamination of the lubricating oil. Under such conditions it is desirable to provide this turbine with a small independent oil purification system. A condensate treatment of turbine oils in service to remove the water soluble acids will retard the rate of rise in the neutralization number and its consequent corrosive and sludge forming properties.



FIBREBOARD Port Angeles "20-Year Club" at the June Pivot Club dinner. Not all were present when this picture was taken. Front row, left to right, JOE REMICK, ARTHUR BENSON, C. V. BASOM, WALTER TAYLOR, CHARLES E. COX. Back row, H. V. MORRIS, GEORGE ADAMS, HANS HANSON, HARRY WILSON and T. H. BEAUNE. All except Mr. Adams had previously received their 20-Year Pins.

FRANK FOX received a 15-Year Pin; WILLIAM JANZEN and JOHN F. WALDRON received 10-Year Pins, and WILLIAM B. JONES and RAY ELLIS, 5-Year Pins.

Suggestion awards were made by Resident Manager R. E. BUNDY at the Pivot Club dinner. GEORGE W. BENSON received the capital prize of \$50 for the best suggestion offered in the preceding fiscal year for an improvement in mill operation. Other cash prizes for quarterly suggestion awards went to CLAUDE R. CORYELL, TOM MELLOR, A. E. HUFFORD, R. Q. WALLACE, JOE REMICK, CHARLES E. COX and GLENN GORDON.

George Adams entertained the crowd after dinner with moving pictures, including some shots of the golf tournament preceding the previous Pivot Club meeting. Some of the golfing form exhibited by the mill men was good for caustic comment from the critical audience.

C. Testing and Maintenance of Records

● Thermometers should be installed on oil inlet and outlet lines to the bearings to determine the oil temperature rise. This oil temperature rise is an index to the properties of the oil over any normal extended period. An analysis of the oil in the system should be made once per month and determinations used to maintain the following records:

TURBINE LUBRICATING OILS

Turbine No.	
Date	
Days of Service	
Gravity ° A.P.I.	
Color	
Flash (Closed cup) ° F.	
Viscosity S.U.S. at 100° F.	
Viscosity S.U.S. at 210° F.	
Water by distillation %	
Neutralization Number	
Steam Emulsion Number (A.S.T.M.)	
Saponification Number	

Comparison of above monthly records will indicate trends and the necessity of applying corrective measures for the proper maintenance of lubricating oil properties. Companies supplying lubricating oils will generally make the above analyses working with the steam plant operators in maintaining the desired control.

(2) Deposits on Nozzles and Wheel Blading: In addition to decreasing turbine capacity and efficiency, accumulation of such deposits may ultimately increase pressure differentials to a point where wheels

and diaphragms may become distorted sufficiently to wreck the turbine.

These salt deposits are a result of the steam boiler characteristics and boiler water conditions and should be corrected at that point if possible.

An analysis of the scale deposit is helpful in determining preventive measures and possible effective means of removal.

Preventive Measures

(a) Maintain lower concentrations of total solids in the boiler water.

(b) Maintain higher sulphate ratios in the boiler water.²

² "How to Remove Turbine Deposits," by B. O. Buckland, from Power Plant Engineering, Vol. 46, No. 4, April, 1942, Page 78-80.

(c) Install steam washers, baffles or centrifugal types of steam purifiers in the boiler steam drums.

NOTE: Whereas items (a) and (b) are contradictory to a certain extent, it was found that one Pacific Coast pulp and paper mill power plant extended the period between blade cleaning approximately 2½ times by reducing the total solids in the boiler water from 3,000 p.p.m. to 1,500 p.p.m. This also was accomplished with a high silica water.

Removal of Deposits

(a) Washing for water-soluble accumulations.

(b) Mechanical removal by sandblasting using fine sand or fly ash.

NOTE: Sandblasting should be done remote from the turbine room and parts thoroughly cleaned afterwards to prevent sand from getting into the lubricating system.

(c) Scraping by means of hand tools properly formed to the convex and concave contours of the turbine blading.

(3) Maintenance of Condensers and Auxiliaries—Condenser Tube Selection and Maintenance: Due to

the present extensive naval and merchant marine shipbuilding program condenser tubes are extremely critical. The variations in local cooling water conditions preclude the possibility of specific recommendations as to tube material selection. However, where tube life appears to be subnormal due to rapid corrosion or dezincification operators should request advice from the metallurgical department of tube manufacturers.

Internal corrosion near the tube ends may be retarded by the use of protective ferrules. Replacing the standard ferrules at the inlet end of the tubes using a flush streamlined ferrule is recommended.³

³ "Scovill Condenser Tubes," by Scovill Mfg. Co., Waterbury, Conn., Page 46-47—Subject "Installation Methods."

The presence of iron has been found to accelerate corrosion of condenser tubes. Where disintegration of the cast iron water boxes has been found to be cause of the presence of iron, then painting or enamelling the inside of the cast iron water boxes has proven beneficial.

Welding technique can be developed to replace corroded tube ends with short sections of new tube thereby salvaging a large percentage of the material.

Periodic removal of scale deposits in the steam nozzles of air ejectors will increase the efficiency of the unit.

Steam Piping, Fittings and Valves

Steam Piping and Fittings

● There is no known practicable substitute for the cast iron, carbon, or carbon-molybdenum alloy steels used in the fabricating of steam piping and fittings.

Also in many states of the union "boiler code laws" are in force governing the material specifications and methods of fabrications which preclude specific recommendations.

Therefore this article must be confined to general statements and references, which may assist operations in conserving the life of present equipment, material, labor and machine tool time required in making necessary replacements and extensions.

Care of the Steam Piping System

● The installation and proper maintenance of steam separators and traps is of vital importance, otherwise accumulations of condensate may result in water hammer which may ultimately cause the rupture of fittings and valves.

Should a steam trap not be avail-



GEORGE W. BENSON (left) being congratulated by ROBERT E. BUNDY, Resident Manager, Port Angeles Division, Fibreboard Products Inc., upon his winning the \$50 capital prize for the best suggestion for improvement in mill operations in the preceding fiscal year.

able an orifice made of steel plate with a hole drilled through may be substituted. The steel plate is inserted between two flanges and it is advisable to harden the steel plate after drilling. This application is quite feasible where the rate of condensation is reasonably uniform and the orifice is of the correct size.

In the replacement of gaskets on flange joints it is common practice to use critical materials as monel and stainless steel. The writer has for the past seven years been replacing corrugated Monel and stainless steel gaskets with a sheet packing developed for hot oil service. Gaskets cut from this sheet packing have given better service than the original metal gaskets on steam conditions up to 400 p.s.i. and 700 deg. F. total temperature.

Welded Joints and Fittings

- In the field of extensions and replacements to the steam piping system, the use of welded joints and fittings offers a definite contribution to the conservation program.

Earlier pipe joint welding was done to a large extent with the acetylene welding process. However, the development of the coated electrode has made it possible to make strong, ductile, and sound welds by the electric arc welding process.

Tests for the proving of welding processes and qualifications of welding operators are covered in the rules of the A.S.M.E. boiler construction code, the American Welding Society, and the American

Standards Association Code for Pressure Piping.

Preheating and stress-relieving is not necessary where the pipe is carbon steel, with a wall thickness less than one-half inch, and where the steam pressure and temperature is below 425 pounds per square inch and 850 deg. F. respectively. Pre-heating of carbon-molybdenum steel piping is necessary and as this class of piping is generally used on pressures and temperatures above 400 p.s.i. and 850 deg. F. respectively, stress-relieving is also required.⁴

⁴ Piping Handbook by Walker & Crocker—Published by McGraw-Hill Book Co., Inc., N. Y.—Page 366.

Portable preheating and stress-relieving equipment is available for field welding operations and the use of horseshoe clamps spot welded to the pipe for holding the ends in alignment during the welding procedure facilitates the process.⁵

⁵ Heating, Piping and Air Conditioning—Vol. 14, No. 5—May, 1942—Page 285, by H. J. Peterson.

Valves and Valve Trim

- With the introduction of higher steam pressures and temperatures in the pulp and paper industry power plants considerable difficulty has been experienced in selecting the most suitable material for valve disks and seats.

Where cutting of the valve seating faces has been experienced welding Stellite to the contact surfaces and grinding same has proven beneficial. Stellite is an alloy of cobalt, chromium and tungsten and valves

can now be purchased having a Stellite trim.

"Dexter" valve reseating machines afford a major contribution to the conservation program. These are designed to reface globe, gate and pump valve seats. Descriptive literature is available from the manufacturer, The Leavitt Machine Co., Orange, Mass., U. S. A.

* * * *

The following is an interesting case of correcting an inherent weakness in a manufacturers design of angle type blowdown valves.

A large number of identical valves developed leaks between the screwed seat and the body of the valve and the following procedure was successfully used, eliminating the necessity of purchasing new valves.

The screw seats were removed from the valve bodies and the valve opening was machined true. Double flanged inserts were machined from scrap steel shafting. A Stellite bead was welded, and ground to form the valve seat. This application proved entirely satisfactory.

Hawley Office Changes

- Mrs. Alice Moore, billing clerk, Hawley Pulp and Paper Company, Oregon City, Oregon, was transferred to the company's San Francisco, California, offices during mid-July. Mrs. Moore is now secretary to Sherman Hall, sales manager of the San Francisco office. She has been with the company for nine years.

Eleanor Pope, secretary to Sales Manager A. D. Hosfeldt, Hawley Pulp and Paper Company, Oregon City, was also transferred in mid-July. She is now secretary to William O'Malley, sales manager of the Los Angeles office of the paper company.

A farewell party was given for the ladies on June 26th, by the office employees.

Camas Technical Men

Join Army, Navy

- Jim Darby, of the technical control laboratory, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, left for the army the first of June.

Don Persons, paper tester, technical control laboratory, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington, left the employ of the company the first week of June, when he enlisted in the United States Navy.

Joe McQuaid With Electric Steel

- Joe McQuaid, formerly sales engineer at Griffith Rubber Mills, Portland, Oregon, became associated with Electric Steel Foundry Company on the first of June. He is in the Esco ship valve department.

Mr. McQuaid spent two months with Willamette Iron and Steel Company, in the purchasing department, before taking over his present position. Prior to these recent changes, Mr. MacQuaid had been with Griffith Rubber mills for five years.

Winton Urges Concentration On Papers For War Uses

Warns industry not to try regaining lost markets—Foresees smaller, selective production of essential papers.

- Speaking before around 500 pulp and paper men at a one-day meeting at the Waldorf-Astoria Hotel in New York, on July 2nd, David Winton, chief, Pulp and Paper Branch of the War Production Board, urged the industry not to spend any time seeking to regain lost markets, but to concentrate upon products that will be of service in the war effort.

As paper requirements for war uses expand during the next four to eight months, smaller and more selective production of paper is in prospect, he indicated. Less essential production would be curtailed by priorities regulations, which have not as yet hit the paper industry as

hard as some other industries, Mr. Winton said. Critical materials available to the industry now are at the highest point they will be for the duration.

Mr. Winton emphasized that the industry must justify itself to obtain critical materials. Backlogs and the current slump in business in view of the indicated production trend, with less important uses of paper to be reduced, did not worry the Government officials, he said, and urged the industry to think about paper as a substitute for replacing products formerly made of steel and lumber.

On July 3rd a similar meeting was held in Chicago attended by a group of middle western pulp and paper men.

Longview Box Plant Bowlers Win Mill Tournament

• The Longfibre Bowling League, made up of employees of Longview Fibre Company, Longview, Washington, has completed its second annual play-off with a post season banquet at the Hotel Monticello. This year's activities included 27 weeks playing, with each of the nine teams playing every week, except one team which would "by."

The box plant team was the winner of the season play-off, with the machine room team as runner-up. High individual game was played by Fred Graham, of the box plant, with score of 280. High individual series was obtained by Claude Miller, mechanic, with score of 670; high team game, won by the construction team with score of 1075 pins. High team series was taken by the office team with 3,031 pins—all scores quoted with handicap.

Three teams from Longfibre Bowling League entered the Northwest Bowling Tournament in Seattle during the month of May, with one of the teams winning the Booster team division, for which each member of the team was awarded \$7.00. Carl Fahlstrom, assistant resident manager, Longview Fibre Company, tied for third place in the Booster singles of the tournament. He received a check for \$42.50 as the prize. Andy Stein, of the machine room team, won eighth place in the Commercial singles, netting him a prize of \$39.00.

Officers elected for the ensuing year include A. P. Siebers, president; Vance Roley, vice-president; and Tom Mendenhall, secretary-treasurer.

Eight Pacific Paperboard Men Join Army and Navy

• During the months of May and June eight employees of Pacific Paperboard Company, Longview, Washington, joined the nation's armed forces; three going into the navy and five in the army. Those men going into the army include Carl Snyder, Earl M. Murray, LeRoy Lamb, Vern Anderson and E. E. Flood, Jr. Dallard Blackburn, Frank B. Ray and D. Bradburn joined the navy.

During the past 15 months 22 of the company employees have joined the armed forces.

Gallaway Picks Cherries On Vacation

• G. H. Gallaway, assistant technical supervisor, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington, took a week's vacation late in June at his parents' fruit ranch near Hood River, Oregon. He helped relieve the farm labor shortage by spending the week picking cherries.

Harry Koehler Marries Mrs. Hannaford

• Harry Koehler of the Seattle consulting engineering firm of Marshall & Barr, and Mrs. Alice Hannaford, secretary in the main office of the Puget Sound Pulp & Timber Co., Bellingham, were married early in June at Lewiston, Idaho.

Their friends learned the news upon the couple's return from a honeymoon to California. Mrs. Koehler is a sister of Carl Sahlin, log buyer for the Puget Sound Pulp & Timber Co.

Niles Anderson Third Vice President of Superintendents

• Niles M. Anderson, mill manager, St. Regis Paper Co., Kraft Pulp Division, Tacoma, was elevated to the third vice presidency of the American Pulp and Paper Mill Superintendents Association at the annual meeting in Grand Rapids, June 16th-18th.

Mr. Anderson, who was chairman of the Pacific Coast Division of the Superintendents in 1941, served the past year as fourth vice president of the national body, succeeding the late L. S. McCurdy.

Two Washington Pulp Men Enlist in Navy

• Two of the "old timers" at the Washington Pulp and Paper division of Crown Zellerbach Corporation, Port Angeles, now are members of Uncle Sam's Navy.

N. F. Ott, machine tender with a 20-year employment record at the mill and a veteran of Navy service in the first World War, has been enlisted with the rank of coxswain. He was to report for duty July 14.

Percy Pollanz, employed by the company since 1924, also was enlisted in late June and was waiting at home early this month for his call to duty. A back tender at the mill, he has served several terms in offices of the Paper Makers' local at Port Angeles, is the present exalted ruler of his Elks lodge and was a member of the Port Angeles city civil service commission and director of observation posts of the Civilian Defense air raid precaution service.

C-Z San Francisco Service Pins Awarded

• R. E. Richmond, in the tax department of the Crown Zellerbach Corporation, was awarded a 30-year service pin by W. B. Sanders, tax supervisor of the company.

Helen Zaharis, in the accounting department of the Crown Zellerbach Corporation, was recently presented with a 20-year service pin.

Frank Shea, warehouseman of the Crown Zellerbach Corporation, was awarded a 25-year service pin by R. O. Young, assistant vice-president of the corporation.

Chidester Named Chief Pulp and Paper Division

• Gardner H. Chidester, for the past 16 years closely associated with sulfite and semi-chemical pulping process investigations as a member of the U. S. Forest Products Laboratory's Division of Pulp and Paper, has been appointed chief of that division, it is announced by director Charlie P. Winslow.

Mr. Chidester came to the laboratory in 1925 from the editorial staff of Paper Industry, Chicago. Among his first assignments at the laboratory was a waste survey, carried out in cooperation with a number of paper mills, which resulted in methods of reducing white-water fiber losses. Shortly thereafter, he began his work with semichemical pulping processes, then in the pioneer stage. He participated in the establishment of a semichemical mill for pulping of southern hardwoods, including the gums, at Hartsville, S. C., in 1927, where wrapping paper was produced.

The following year Mr. Chidester began his work on the adaptation of the sulfite process to new species, and growth-quality relationships of pulpwoods. Among his contributions has been a method of recovering soda and sulfur from soda-base sulfite liquor for reuse.

Mr. Chidester succeeds the late C. E. Curran as chief of the Division of Pulp and Paper.

Currently, the division is occupied with wartime research problems, including the development of substitutes from pulp and paper for critical war materials, diversification of species for pulping, and methods for improving pulp yield.

A native of Hastings, Mich., where he was born in 1897, Mr. Chidester was graduated from the University of Michigan in 1920, where he majored in chemical engineering. For about 3 years thereafter he worked for the Kimberly-Clark Corporation at its mills at Niagara, Wis., and Kapuskasing, Ont., as mill apprentice and later as tour foreman. He then joined the staff of Paper Industry. While attending the University of Michigan he was a member of Alpha Chi Sigma and Phi Lambda Upsilon, chemistry fraternities; Tau Beta Pi, engineering fraternity, and Sigma Xi, scientific fraternity.

OUR BOYS IN SERVICE HONOR ROLL			
RAY GREENB	NOV. 3 1941	ARCHIE FOX	APR. 8 1942
J.A. DURLAP	DEC. 9 -	T.J. CUNNINGHAM	" 10 "
E.L. OLSON	" 23 -	T.F. KOERNER	" 10 "
A. LARSEN	JAN. 1 1942	ART ISAACSON	" 10 "
J.E. BROWNE	" 12 -	FRANK MCLEOD	" 12 "
DARRELL JAMES	FEB. 3 -	C.E. OLSON	" 12 "
CARL DAHL	" 8 -	WILLARD METZGER	MAR. 5 1941
J.H. WILLIAMS	" 17 -	E.P. MC ALLISTER	APR. 6 -
SAM CAVALLI	" 20 -		1942
W.A. DAVIS	" 23 -	CLIFF BULLARD	MAR. 13 -
E.E. CARLSON	MAR. 5 -	EVERETT JANSEN	MAY 6 -
E.R. DEAMER	" 9 -	B.R. JOHNSON	" 15 -
CECIL MARTIN	" 8 -	J.E. CHANDLER	" 15 -
B. LYBARGER	" 9 -		
A.B. VANCE	" 15 -		
HERB LARSON	" 22 -		
J. MUZNARICER	" 31 -		
J. SEVERSON	APR. 6 -		
J.M. SMITH	" 8 -		
J.M. MUNKRES	" 7 -		

OVER FORTY of the PUGET SOUND PULP & TIMBER CO.'S men are now in the armed forces, and, as a reminder of their service to the country this bulletin board has been erected at the mill.

So far the Army and the Navy are about equally represented. The men whose names are listed above are serving in Iceland, Alaska, Dutch Guiana, Australia, with the fleet and in various parts of the United States.

Cellulose Comes to Aid Of Packaged Products

Ingenious combinations of Cellophane, paper and chipboard substitute for tin, foil, rubber and glass.

THE shortage of tin, tinfoil, rubber and of some plastics has created packaging problems for producers of a great variety of products. Turning to glass they found that the glass container makers may not be able to handle the increased demand, and that deliveries are slow. Besides, rubber seal rings, needed by products packed in vacuum in glass, are limited in use.

For many manufacturers it is a case of finding a plentiful substitute or going out of business. Cellulose, in the form of du Pont cellophane, paper and paperboard, is proving a satisfactory substitute for a wide variety of packaged products. Ingenious combinations of cellophane and paper and cellophane and board have been developed by package engineers. Many of the new ideas were displayed at a recent conference sponsored by the American Management Association which was fully reported in the May 1st issue of "Tide," magazine of advertising and marketing. Quoting:

• "In Manhattan's Hotel Astor last fortnight packagers foregathered for the 12th annual conference sponsored by the American Management Association under the shadow of the cracker barrel. Within two months a steady rain of government orders had deprived many of them of tin, foil, plastics and rubber and limited their use of cellophane, black-plate, enamels, and chemical pigments.

"Most abundant packaging materials currently are glass, paper and related products like fiberboard, lumber and cooperage. But the War Production Board has been forecasting probable shortages of well-seasoned wood, now used in enormous quantities for export shipments of ordnance, tanks and plane parts, by Fall. Wood pulp, on the other hand, is still moderately plentiful, and it is pulp that figures most prominently in the current raft of packaging experiments.

"By last fortnight, du Pont's cellophane division had already five methods of using regenerated cellulose film, paperboard and glassine to pack syrups, grease, powdered foods, coffee, fruit juice, dehydrated vegetables (see cut). For though cellophane is banned as a decoration and wrap for razor blades, soaps, etc., it is still obtainable for such essentials as food.

"One container, shaped like a cylindrical ice-cream can and made of cardboard laminated with cellophane, has been adopted by the R. B. Davis Co. for its baking powder. Standard Brands expects to use the package, in lieu of tin cans, for part of its Royal baking powder. A Brooklyn grocery firm, H. C.

Bohack & Co., puts up Wiz lard in a somewhat similar canister.

"Consumer advertising on the new fiber can breaks in June with four-color inside covers scheduled for Life and Saturday eve post and space in a string of trade papers.

"Another du Pont package is the bag-in-box, manufactured by Package & Container Corp. of New York City. The two-piece container consists of an outer boxboard shell and an inner bag made of heavy regenerated cellulose, said to be suitable for packing dehydrated, quick frozen, liquid and greasy foods. It is constructed on the patents held by inventor Harry Waters for heat-sealing and drawing a perfect vacuum in flexible containers. Package & Container Corp. launched the idea for vacuum packing in paper about two years ago (see Marketing-Tide, May 1, 1940) but ran short of plastics which were used as coatings. Concurrently, it is showing a plastic cellulose tube, likewise designed by Waters, for replacing metal collapsible tubes.

"Other recent notable substitutes involving paper and wood:

1. Judd Paper Company's double-coated wet-wax paper, adopted by Defender Photo Supply Co. as a substitute for foil wraps on cut sheet film.

2. Wax-lined cylindrical paper containers, instead of metal, for dry drug products like botanical drugs and psyllium seed packed by United Drug Co.

3. Multiwall paper bags, instead of burlap, for manufacturers and shippers of salt, sugar, flour, etc.

4. Bags of du Pont cellophane laminated to glassine to replace ploifilm and foil, for Lipton's Continental Noodle soup mix.

5. Riegel Paper Corporation's grease-resistant paper for lining chip-board cartons, adopted by Wilkins Coffee Co. of Baltimore. Riegel also is promoting in trade papers an oil-proof anti-corrosive wrapping for metal products, worked out to Army & Navy specifications.

"These and other new products emerging from research laboratories may mean salvation to harried manufacturers of macaroni, dog foods, relishes, tea, coffee and so on. Driven from tin to glass, they now face loss of their new packages by virtue of several recent WPB orders.

"Order M-119 prohibits rubber rings on glass containers for more than 40 product groups. These include animal food, candy, coffee, flavoring extract, vegetable greens, macaroni, soups and chowders, tea, whole apricots and pears, corn on the cob. White hope for packers of foods like whole fruits and vegetables, whose products may be automatically excluded from glass because of the new order, is the experimental work of glass manufacturers like Owens-Illinois on ways to vacuum pack without rubber sealing closures.

"Another regulation bans tinplate and terneplate in fabricating crown caps for beer and soft drinks, cover caps for catsup, chili sauce and home-use jars, screw

bands for two-piece home-canning closures and lids for things like coffee, tea, certain dry spices, candy, peanut butter, fly spray, oleic acids. Blackplate, a tin substitute, is hard to get (see Marketing-Tide, April 1) and many expect the WPB to ban its use in containers almost completely.

"To date the glass industry has been able to handle its mounting volume of orders. It has pronounced itself capable of a 30 per cent production increase with existing facilities if manufacturers simplify their orders. Many have already abandoned fancy shapes and unnecessarily heavy jars to concentrate on simple standard designs which take less material and production time. To reduce the amount of rubber and metal required for closures, WPB experts have recommended smaller jar openings and the larger containers.

"Collapsible tin tubes were taken from food, cosmetic and most toilet goods producers by the WPB last month. Only items now getting 100 per cent tin containers are certain medicinal and pharmaceutical ointments; other medicinal ointments, preparations to use in the body orifices, toothpastes and shaving creams can be packaged in tubes of 7½ per cent tin.

"To conserve metals and to skirt complications arising from the government's order that an old tube must be traded in for every new shaving or dental cream holder, some companies like Mennen's are dropping their tin packages of brushless shaving cream and concentrating on jars. Bristol-Myers made a similar switch on Minit-Rub. Palmolive, while not giving up tubed brushless shaving cream, has added a medium-sized jar to its line which carries the same amount of cream as the large tubes and retails at an equivalent price.

"Like thrifty New England housewives, packagers and retailers are spreading out their present supplies of the traditional materials—tin, paper, glass, cardboard, string—by salvaging and conservation when possible.

"In Chicago newspapers last month, Nicolay-Dancey advertised that it would give a 10c refund on empty New Era potato chip cans and lids. "Save this container," copy said, "it can be reconditioned and that much metal will be saved."

"Inner wraps in bread packages have been either discarded or reduced in size by 69 per cent of the members of Quality Bakers of America questioned in a recent survey; 13 per cent more are preparing to follow suit. Oneida, Ltd., has reorganized its packaging operations by replacing some 171 different gift boxes with one standard gray carton."

"In its publication, "Packages & People," du Pont says of the new packages:

"For many years, the container industry, in cooperation with du Pont technicians, has been working

with cellophane to find ways in which the strength, moisture-vapor-proofness and the gas-impermeability of cellulose film could be employed to improve the construction of chipboard parts and containers so that they could be used for a wider range of products than heretofore.

"Since the war started, this work has been speeded up due to the increasing shortage of metals needed for our Armed Forces . . . the lend-lease program . . . and due lately to the tin plate limitation order.

"As a result, several practical methods of combining cellophane and chipboard have been developed, utilizing present manufacturing equipment, which permit the replacement of the can body, often saving 70 per cent or more of the total metal—and some which make possible the construction of entire containers using no metal at all.

"These containers, of course, are not as strong as metal, nor adapted to all products. For instance, they cannot handle foods processed at high heat after packing. They will not protect certain products for as long a time.

"On the other hand, they are sufficiently strong to meet normal transportation requirements. They are well adapted for the packaging

of many products now packaged in metal, holding them satisfactorily for their usual turnover period with a sufficient factor of safety.

"Some of the packages now in commercial use are illustrated and described—also the construction of various types of containers employed both for unit and bulk packaging.

"A number of leading container manufacturers are now in a position to supply packages of these types."

Screene Plate Orders Now Require End Use Symbols

● In an advertisement in this issue, the Fitchburg Screen Plate Co., of Fitchburg, Mass., states, "You can get necessary screen plates provided your operation is essential to War effort or civilian needs. No screen plate orders have yet been deliberately refused by the WPB." The advertisement advises that the new "end use symbols" must be noted on order forms sent in.

McGregor Represents Coast At Superintendents

● George H. McGregor, first vice chairman of the Pacific Coast Division of the American Pulp & Paper Mill Superintendents Association, represented the coast group at the annual convention in Grand Rapids, Michigan, June 16-18th. Mr. McGregor is superintendent, Longview Mill, Pulp Division Weyerhaeuser Timber Co., Longview.

International Paper Closing Three Mills

● The International Paper Company has closed three of its mills at Fort Edward and Herkimer, N. Y., and at Orono, Maine.

Fort Edward, a six-machine book and bond paper mill, had a rated capacity of 180 tons per day besides 19 tons of bristol and folding box boards. The Herkimer Fibre Division produced 25 tons of leather board heeling, shanking board, veneer board and fiber board. The Orono mill produced 60 tons of hanging papers on two machines and has groundwood capacity of 42 tons per day.

The Holed-Tite Packing Division at Herkimer, is still operating, producing moulded pulp products.

Otto Hartwig's Son Married in Portland

● Lieutenant O. Robert Hartwig, Jr., son of Otto R. Hartwig, social security and general safety supervisor for Crown Zellerbach Corporation and Rayonier Incorporated, was married to Miss Ruth E. Durham, of Portland, Oregon, June 6th. The ceremony took place at the St. Rose church and was immediately followed by the arrival of three army air planes which flew overhead in recognition of the event.

Lieutenant Hartwig recently received his wings at a ceremony in southern California and is now stationed at the Portland Air Base.

During the week of June 1st Hartwig was further honored when the Portland Traction Company picked him as the "Citizen of the Week," displaying his photograph with a short biographical write-up in all of the company's street cars and trackless trolleys.

Five Ways Cellophane Can Save Metal in Packaging



Cellophane is laminated to side walls of spiraled chipboard. Tin top and bottom crimp onto ends.

- A. CELLOPHANE
- B. CHIPBOARD
- C. CELLOPHANE

No metal used. Entire container body, top and bottom are made of chipboard laminated with cellophane.

- A. CELLOPHANE
- B. CHIPBOARD
- C. CELLOPHANE

Cellophane is "sandwiched" between the layers of chipboard during manufacture.

- A. CHIPBOARD
- B. CELLOPHANE
- C. CHIPBOARD

Bulk unit. Multi-walled paper bag. Cellophane laminated to innermost wall with asphalt binder.

- A. CELLOPHANE
- B. ASPHALT
- C. PAPER BAG

Cellophane bag set snugly in regular type carton. There are several variations of this container.

- A. CELLOPHANE BAG
- B. CHIPBOARD CARTON

A Psychological Approach May Be the Answer

To your priority problems . . . The Greeting Card Industry has had itself psychoanalyzed and the experts find greeting cards are psychologically essential in maintaining war time morale . . . An idea for other branches of the industry.

From the Greeting Card Industry, an association of over 100 manufacturers and publishers of greeting cards comes an idea for proving the essentiality of the business in war time that may be helpful to other branches of the industry.

Instead of relying upon statistics to prove its value under present conditions, the Greeting Card Industry has called in the psychologists to carry their standard. Statistics bring up the rear.

This is an interesting and different approach. Most divisions of the industry have been trying to find out what percentage of their production serves directly and indirectly in the War Program. Sales departments have been tracking down the ultimate use of every sheet of paper, of every bag, box and napkin to see if it is finally used in connection with war production.

The resulting statistics are rather dry. They lack psychological appeal. If, for example, a survey showed that 40 per cent of the paper napkins produced last year were used by war plant workers in their lunch boxes, the reaction might be that cloth napkins could have been used.

Suppose the napkin industry took a color photograph of a war worker who had just finished his lunch, grinning at a red, white and blue paper napkin upon which appears a comic cartoon of a fellow like himself kicking Hitler, and a slogan such as this, "Eat Right—Keep Healthy—Kick the H out of Hitler."

The paper napkin has been transformed from a utilitarian product to a morale builder, a propaganda medium. It urges correct eating to build health and it injects a bit of humor to aid the digestion and the spirit by means of the humorous cartoon. Then the statement that 40 per cent of paper napkins are used by war workers will really carry weight for it creates the mental picture of many thousands of war workers receiving a shot of morale building.

The Greeting Card Industry has followed this approach in studying the place of greeting cards in war time. It has published a four-page folder entitled, "The Place of the Greeting Card in Our National Life From the Psychological, Social and Economic Viewpoints."

According to the industry the greeting card is just 100 years old, the first one having appeared in England in 1842. It is reproduced on the cover of the folder from the original now in the British Museum in London. Pen and ink sketches of happy Christmas scenes surround the greeting, "A Merry Christmas and a Happy New Year to You."

The greeting card industry's self-analysis discloses that nearly three billion greeting cards will be sent by Americans during 1942, or more than 20 cards for each person in the United States. From here on the folder speaks for itself.

"The greeting card provides a modern way of satisfying age-old needs. It is an expression of man's desire for friendship, kinship and affection. It is a means by which the inarticulate may find a voice for their feelings. Thus it helps to strengthen morale and to preserve the unity of our social structure. These functions are examined in this folder, to demonstrate how the greeting card meets the requirements of a people at war.

"The following specific questions are answered:

"What is the greeting card?

"What is its history?

"What needs does it satisfy?

"What are the economics of the industry which produces it?

"What is the relationship of the greeting card to our present war situation?

The Greeting Card

"The exchange of greeting cards reflects the daily life of the average American.

"There is no occasion within the life span of an individual for which an appropriate greeting card, suited to every age, taste, event and mood, cannot be found.

"They cost as little as a penny for simple unpretentious designs, and range up to several dollars in cost for reproductions of fine paintings and for elaborate Valentines.

"A representative retail dealer will carry in stock a wide selection of specific kinds of greeting cards, broadly classified as "seasonal" and "everyday" cards.

Seasonal Cards

"Seasonal cards cover every holiday on the calendar. For each holiday there

is an appropriate variety of both secular and religious designs.

Everyday Cards

"Everyday cards have a personal significance.

"They include: Birthday cards of both a general and humorous nature, suitable for friends and relatives, appropriate for all people of all ages. Cards to be sent to those who are ill. Announcements of engagements, weddings, the arrival of babies. Congratulations on the arrival of a baby, on a graduation, a marriage, an anniversary, and many other occasions. Cards to be enclosed with gifts of all kinds. Thank you cards.

"Expressions of sympathy on the loss of a friend or acquaintance. Cards to express friendship. Invitations to parties and to showers. Cards to be sent on the various occasions of religious significance. Cards to be sent to men in the Service. Cards which are based essentially upon current and topical events.

"Both the variety in which greeting cards are available and the quantity in which they are sent testify that they fulfill a public need and demand.

The History of the Greeting Card

"Man has always found some means by which to exchange greetings and salutations upon appropriate occasions. The papyrus salutations used by the Egyptians; the Apostle Paul's phrase "Grace to you and Peace" in his Epistles; the exchange of symbols such as gloves, garters, handkerchiefs, or bows, in the Dark Ages of Europe—all these were manifestations of this basic social urge.

"In the United States the first greeting cards were the work of a Boston lithographer, Louis Prang—an exile of the German revolution of 1848—who made the public conscious of the value of fine art reproductions. His example soon led others to venture into the field—others who first published only Christmas cards, but who soon commenced to manufacture a wide variety of types of greeting cards. Shortly after the beginning of the twentieth century, greeting card publishers began to spring up in increasing numbers.

"After the early 1920's, and continuing to the present time, the public demand for more and better greeting cards has continued to grow rapidly.

"Today the exchange of greeting cards is the accepted means by which millions of Americans remember their friends and loved ones, not only at Christmas, but throughout the year. And the greeting card in America, by answering in its own modern way, social needs that are age-old, is rapidly becoming indigenous to our national life.

The Needs Satisfied By Greeting Cards

"A recent nation-wide survey conducted by expert psychologists reveals the

importance to the public of greeting cards. It was learned that—

"Greeting cards are a means by which people who find difficulty in expressing themselves may easily and gracefully convey their greetings and good wishes to others."

"Greeting cards help to celebrate holidays and occasions of special significance. Thus, in providing rallying points for the closer unification of our people, they help to preserve, in our social structures, values which might otherwise be lost."

"Greeting cards, at a time when many separations are occasioned, and many disruptions of family life take place, help to overcome the anxieties of loneliness, and make people better able to cope with the difficulties confronting them."

"The emotional impact of the greeting card on the recipient is best demonstrated by the fact that most people who receive greeting cards preserve them for at least a little while before disposing of them. When discarded, greeting cards go on to serve a further purpose by yielding their raw materials for reprocessing."

"The survey further discloses that any restriction in the distribution of greeting cards would result in the use of some substitute for the exchange of greetings and good wishes—and that this substitute would require the use of paper in equal or greater amounts than now used in the production of greeting cards."

"Thus, the greeting card serves the public interest, providing emotional outlets and social gratifications on a desirable, non-wasteful basis."

The Economics of the Industry

"The greeting card industry is comprised of over 100 manufacturers and publishers and gives employment to thousands of individual wage earners, including executives, artists, writers, craftsmen, factory workers, salesmen, retail dealers and clerks. At the same time, the industry uses a comparatively small amount of material, as is suggested by figures showing that the manufacture of greeting cards requires but a fraction of one per cent of the total paper output of the country."

"It is also interesting to note that the industry utilizes no vital or critical materials; does not interfere with war production; yields up its materials for reprocessing. Shipments require but little transportation space."

"The greeting card industry further contributes to national welfare through the post office revenue which it provides. Public mailing, together with postage within the industry, amounted to approximately \$50,000,000 in postal revenue for the fiscal year ending June, 1940. This represents approximately 10 per cent of the total postage revenue."

"In 1940 the industry paid almost \$2,000,000 in taxes, of which eighty-five per cent went to the Federal Government for social security, income and other taxes. Thus, through postal revenue and taxes the greeting card industry returns to the government an amount several times greater than the value of the raw material it consumes."

"It may be said, then, that this industry uses little raw material, gives employment and livelihood to many and, at the same time, provides worthwhile revenue to the government."

The Relationship of the Greeting Card to the Present War Situation

"It is important in wartime to avoid the dislocation of social and family life, to maintain the courage of individuals,

and to strengthen the bonds of friendship among our people."

"Much of contentment and courage, and material good, would be lost if greeting cards were not available."

"In evidence of this, let us again review the constructive services provided by greeting cards:

The Manufacture of Greeting Cards

"By providing social contacts—by satisfying the desire to be remembered and to remember—by giving voice to inarticulateness and by dispelling loneliness—

"Helps bring individuals and families closer together through their mutual celebration of events of personal significance.

"Helps unify our country on our national holidays by aiding in the observance of age-old and country-wide traditions.

"Helps encourage the men in our armed services by increasing the number

of messages sent to them by loved and remembered ones at home."

"Helps to accomplish these purposes for the individual and for the country, with a minimum expenditure of time, money and effort."

"Is economically sound even in wartime because it—

"Consumes little raw material and yields that material back for reprocessing."

"Provides useful work and livelihood for thousands of people—most of them women and unskilled workers."

"Provides millions of dollars of revenue to the government through post office revenues and taxes."

"Therefore, from the psychological, social and economic standpoints, it is in the national interest to continue the manufacture of greeting cards to help maintain those relationships between friends and family which are the foundations of American unity."



GREETING CARDS AID WAR STAMP SALES . . . To promote the sale of 10¢ War Stamps as gifts, The Greeting Card Industry, Inc., has developed these special cards to sell at 5¢ each . . . Inside each is attached an album or envelope to hold \$18.70 in War Stamps . . . These cards furnish a handy way to combine patriotism with friendly birthday or gift greetings, and serve as a suggestion to help win the war with War Stamps.

Sales and distribution are being made on a non-profit basis by the publishers through the establishment of The Greeting Card Industry, Inc., New York . . . War Stamps Christmas Cards are now being prepared for sales on the same basis.

"Ample Raw Material For Rayon"

• States Francis A. Adams, editor, "Rayon Textile Monthly," in an editorial in the June number. Quoting Mr. Adams in full:

"With the radio commentators blaring into our ears a constant stream of admonitions that the American people must 'Save their old tooth paste tubes,' 'Clean out the cellar and attic for scrap rubber,' 'Com the cellar for bits of scrap iron,' in order to fill the gap of indispensable materials needed in the war effort; and with this same admonition coming from the daily press, it is a relief to know that the people are not being called upon to ransack their homes to find available material from which to manufacture rayon yarn. Nature is the illimitable source from which the raw material for rayon is drawn. Spruce and hemlock pulp and cotton linters are the raw materials essential for the manufacture of rayon and these products are available on this continent."

"Coincident with the fact that the raw material, in the form of pulp, is available, there is also gratification to be found in that necessary chemical materials for making the various types of rayon are at hand and in the most part have been developed as by-products by chemical concerns so that their delivery now, to rayon manufacturers, is not depriving any other essential war activity of materials they need."

"This situation is one that stands in sharp contrast to the chaotic condition that exists in continental Europe where the rayon yarn plants in Italy, France, Belgium, Holland, Germany, and, to a lesser extent, in other countries dominated by the Nazis, are now operated on an irregular and uncertain basis due to the lack of essential materials and to the serious interruptions to transportation that are incident to the 'all out' war effort that engages Europe."

"American textile manufacturers are fortunate in the fact that the flow of rayon from the plants of American industry goes on uninterruptedly and that this is a situation which is not likely to be altered in a detriment way no matter how long the war may continue, or where the heaviest blows may strike. Continental America is in this respect self-sufficient in its means of producing rayon."

And we might add, the producers of rayon yarn and the consumers of rayon yarn, nearly everyone in the country, are very fortunate that a few men developed the production of rayon grades of bleached sulphite pulp to a daily tonnage large enough to meet yarn requirements. Otherwise, rayon would be another product in line for strict rationing.

Mr. Adams and ourselves are assuming that the pulp mills and the yarn plants will be given enough maintenance and repair materials to keep producing. However, man can create a shortage of any material by arbitrary action.

Puget Sound "C" Shift Wins Bowling Tournament

• Bowlers of the Puget Sound Pulp & Timber Company recently completed the thirty-six weeks tournament with "C" shift taking the honors. Over fifty men took part with nine teams playing this third consecutive year. The company offered prizes and a trophy to the winning team.

TAPPI Fall Meeting Planned for Boston

• The annual Fall Meeting of TAPPI, Technical Association of the Pulp & Paper Industry, will be held at the Statler Hotel, Boston, September 28th through October 1st.

According to the Association's announcement, plans are under way to arrange a program of vital interest to the industry. By September the industry will be confronted with an ever-increasing demand and opportunity to carry on its activities on a wartime footing, the announcement continues. By then nearly everyone will have had experience in meeting materials and product restrictions and there will be a definite need for a conference of mill men and advisers from the allied industries to get together and contribute information to the common pool of knowledge to help carry on the industry and win the war.

General chairman of the meeting in Boston is Norman I. Bearse, technical director of the Champion-International Company, Lawrence, Massachusetts. Vice chairman and secretary is Helen U. Kiely, technical director of the American Writing Paper Corp., Holyoke. Vice chairmen are Frederic C. Clark of Newton, Mass., and W. E. Brown of the Piscatare Paper Co.

Other committee chairmen include, W. E. Kenney of the Fitchburg Paper Co., chairman of the Advisory Committee; R. H. Doughty of the same company, chairman of the Arrangements Committee; F. W. Schneider, Hampden Color & Chemical Co., chairman of the Entertainment Committee (Henry F. Bigelow, New England representative of the Pulp Division Weyerhaeuser Timber Company, is a member of this committee); W. L. Foote, B. F. Perkins & Son, Inc., chairman of the Finance Committee; F. K. Becker, Bird Machine Co., chairman of the Ladies Committee; L. H. Tucker, Crane & Company, chairman, Program Committee; H. L. Mellen, Hercules Powder Co., chairman, Publicity Committee; H. T. Barker, Bird & Son, Inc., chairman of the Registration Committee; and, J. P. Kennedy, chairman of the Transportation Committee.

Kraft Bag Paper Is Wrapping Paper

• The long pending question of the classification of kraft bag paper has been decided adversely to the position of the Import Committee which held that this material should not be included in the reduced rate granted to kraft wrapping paper, according to Warren B. Bullock, manager of the committee. Although domestic producers could readily identify bag paper as such, as distinct from what is known to the American industry as wrapping paper, the Customs officials have decided that the intent of the Reciprocal Trade Agreement with Finland was to admit such paper as wrapping paper at the reduced rate of 20 per cent, instead of the original rate of 30 per cent provided in the Tariff Act. The Customs officials originally agreed with the position of the Import Committee, but on reconsideration changed their attitude. The decision will also include kraft envelope paper under the reduced rate for wrapping paper. Under the phraseology of the Reciprocal Trade Agreement Act the domestic industry is denied any recourse to the Customs courts for review of the action of the Customs officials.

Wire Cloth Advisory Committee Named by WPB

• Formation of the Pulp and Paper Wire Cloth Manufacturers Industry Committee was announced June 30th by T. Spencer Shore, chief of the Bureau of Industry Advisory Committees of the WPB. W. A. Kelley, chief, Pulp and Paper and Printing and Publishing Machinery Section, WPB, is the Government presiding officer. Members of the Committee follow:

P. J. Abendroth, general manager, International Wire Works, Menasha, Wis.

William E. Buchanan, president, Appleton Wire Works, Appleton, Wis.

A. F. Crossman, president, Lindsay Wire Weaving Company, Cleveland, Ohio.

Guy A. Disbro, general sales manager, W. S. Tyler Company, Cleveland, Ohio.

Edward Docherty, general manager, Holyoke Wire Cloth Co., Holyoke, Mass.

Peter S. Sinclair, president, the Sinclair Company, Holyoke, Mass.

Harry C. Specht, general manager, Eastwood-Nealley Corporation, Belleville, N. J.

John D. Watson, president, Wisconsin Wire Works, Appleton, Wis.

Rosin Coating Improves Wetting of Rubber

• In a recent news advertisement by U. S. Industrial Chemicals, Inc., a report from Akron, Ohio, was printed stating:

"The wetting characteristics of rubber surfaces can be greatly improved by the simple expedient of applying a very thin coating of rosin. The coating is of particular value in applications such as fountain pens or rubber covered rolls for paper mills in which the rubber is subject to contact with watery materials."

"These claims are made in a patent granted to an inventor here, who says that the coating is more effective than treatment with most commercial wetting agents. A particularly satisfactory coating can be obtained with a solution of 2 per cent by weight of ordinary gum rosin in acetone. Other solvents that can be used include ethanol and butyl acetate."

Bankus Returns To Work

• A. Bankus, vice-president of the Crown Zellerbach Corporation, is back at his desk in San Francisco, following an operation which kept him away from his office for a month.

Dr. Kobe On Active Duty With Chemical Warfare Service

• Dr. Kenneth A. Kobe, formerly associate professor of chemical engineering at the University of Washington, and now professor in the Department of Chemical Engineering, University of Texas, Austin, was called to active duty with the Chemical Warfare Service July 1st.

Reporting as a captain, he was ordered to Edgewood Arsenal, Edgewood, Md. Captain Kobe was first called in February but was placed in the reserve pool until July 1st because of the synthetic rubber project under way at the University of Texas, where the steps in a natural gas to butadiene synthesis are being worked out.

Water Treatment for the Pulp and Paper Mill

by WILLIAM R. GIBSON*

THIS paper is intended to be a discussion of the various forms of water treatment available to the pulp and paper mills, particularly the later developments in this art.

Perhaps water conditioning would be a better word to use to describe what is really required in preparing water for pulp and paper mill use, for water offers so many varieties of impurities that it is really a highly complex material, which may require one or more of many varieties of treatment to make it satisfactory for each of the many uses to which it may be applied in a pulp and paper mill. Some of the objects desired are as follows:

- A. Removal of Suspended Matter
- B. Reduction or Removal of Color
- C. Reduction or Removal of Dissolved Solids
- D. Selective Reduction or Removal of Dissolved Solids
- E. Sterilization
- F. The Addition of Qualities not Present in Natural Water Supply, Which Has Been Made Possible by the Development of Many Wetting Agents, Dispersives, etc., in the Field of Modern Chemistry.

With the many comparatively recent improvements in methods of accomplishing the above results, it is a far cry from the plain filtration which was regarded as the last word in water treatment a few years ago, and it should be remembered that these new methods have arisen largely to meet the demands of industry for higher purity or particular qualities in the water which is so large a part of the production process. There is probably no industry in which the quality and quantity of water required bulk quite so largely as in our own pulp and paper industry. Two examples of the relatively large demands of the mills can be found on the Pacific Coast. One is the city of Everett, with a population of some 30,000, which uses an average of 9 mgd for domestic and ordinary use and 65 mgd in its three pulp and paper mills. The water as it comes from the storage reservoir, goes straight to the mains, without treatment, for domestic use, but the same water is not good enough for the pulp mills, each of which has its own purification plant. The other example is the city of Port Angeles, with a population of only 10,000, using about 4 mgd for domestic and ordinary industrial uses, while the three pulp and paper mills in Port Angeles use among them about 50 mgd. Here again the water is treated in water purification plants, although the city water is untreated.

Going back now to the various forms of treatment referred to above, we have:

• A. Removal of Suspended Matter. This has usually been accomplished by means of slow settling or by filtration through rapid sand filters. In some cases satisfactory water can be obtained by straight

filtration without coagulants, but more usually coagulation by means of chemical treatment has been resorted to, with a settling tank preceding the filters to remove the bulk of the solids by settling. An increasing range of coagulants is available in addition to the widely used filter alum, including ferrous sulphate, ferric chloride, sodium aluminate, chlorinated copperas and ferric sulphate. Clay and other filter aids may also be used to some extent.

• B. Reduction or Removal of Color. Treatment for this purpose in general is accomplished by flocculation with coagulants, the coagulated material absorbing the color, which is then settled and filtered out as in the case of suspended matter. However, in many cases waters which are high in color may be low in total solids and may require the addition of considerable chemicals to provide sufficient floc to absorb the necessary amount of color from the water. Color is mainly due to the presence of organic matter in the water, but may be caused, or increased by the presence of iron, manganese or copper, or combinations of these metals.

• C. Reduction or Removal of Dissolved Solids. Probably the most common example of this is the lime soda softener, most often used with waters comparatively high in calcium carbonate and in which the addition of lime or lime and soda ash is necessary for the precipitation of substantial amounts of calcium and magnesium.

• D. Selective Reduction or Removal of Dissolved Solids. An example of this would be the lime soda softener equipment when used for the reduction of silica, or some of the more elaborate forms of zeolite softeners where the reduction of dissolved solids can be carried almost to complete elimination by successive treatments, with the one exception, that silica is not reduced.

• E. Sterilization. The commonest form of this is the chlorinator, which is in almost universal use in pulp mills, largely because of the necessity to prevent, as far as possible, the growth of slime bacteria in the pulp mill piping and equipment. In the last few years other forms of bactericides have come into use for the control of slime conditions, and quite a number are available today, mostly of the order of chlorinated phenols.

• F. Adding Desired Qualities Not Present in Pure Water. This is a field just lately developed, and it is now possible to prepare water for use in the mill which has qualities not present even in distilled water or in any natural water. These qualities are obtained by the addition of wetting agents or dispersives, of which several examples are already in more or less common use. We propose to refer to this later in the paper.

Development of Coagulation

Having dealt with the various objectives to be accomplished we might proceed to consider what actually takes place

when water is treated to cause coagulation to occur, this being the basis of all ordinary filter plant treatment.

The standard filter plant consists in general of a mixing basin, which may or may not have mechanical agitation, and which may have within itself or may be followed by a flocculation chamber. The purpose of the mixing chamber is to get mixing, or rather diffusion, as rapidly as possible, of the chemicals applied to the water being treated. The flocculation chamber is for the purpose of giving the pin-point particles formed in the mixing chamber as many opportunities as possible to build up and agglomerate into the largest sized particles possible. After the desired degree of mixing and flocculation has been accomplished the water is allowed to flow through a settling basin, and it is important that the path of the water through the settling basin should be at a uniform rate and with as little disturbance, either horizontally or vertically, as possible. The object is to allow the larger floc particles to settle out to the maximum possible extent, leaving all the lighter and smaller particles to be removed by the filters.

The standard settling time for municipal plants has been as high as four to six hours. In industrial plants it probably ranges from one to four hours, the object being to get the floc into the largest possible particles, since in general the larger they are, the more quickly they will settle.

The clarified water from the settling basin passes over a weir, which should have the lip as level as may be possible in order to have a uniform flow rate over the whole width of the basin, and then passes through the filters, where such floc as remains is filtered out on the sand bed.

The improvements which have taken place in the processing of water for filtration have consisted mainly of better devices for diffusing the chemical or chemicals through the incoming raw water, and improved methods of providing controlled agitation in the water in which the pinpoint floc has begun to form. These devices in the beginning consisted of very simple agitators. Later the elbow mixing device was applied to improve flocculation, and had considerable success within its field. It was then superseded by mechanical flocculators of various kinds, which showed very substantial improvement over any static device available.

It should be noted that the advantage gained by the mechanical flocculator is to increase positively the mixing of the water to multiply the opportunities for the floc particles to build up.

In the past few years a new viewpoint has been taken regarding this question of flocculation, and the idea of recirculating previously formed sludge has been applied, with a view to improving the flocculation, reducing settling time, and getting higher efficiency from the chemicals fed. Several processes of this kind are on the market. We will refer only to the Accelerator, made by Infico, Inc., formerly International Filter Company, because it embodies rather unique methods of applying the principles.

*Manager, Northwest Filter Co., Seattle. Presented at the Annual Meeting of TAPPI, Hotel Commodore, New York City, February 16-20th, 1942.

Accelerator Principle

- In the Accelerator there is no separate mixing chamber. This process, which combines all the functions of mixing, coagulating and settling, including automatic removal of excess sludge, consists in general of a circular tank with a central draft tube and two agitators. A bed of slurry is kept in continual motion in the lower part of the tank. The chemicals are applied directly to the circulating slurry. This slurry is kept moving at high velocity up through the draft tube and down through an annular ring, back to the bottom, the rate of circulation being about five times the throughput rate of the water being treated.

The Accelerator may be used for several purposes, precipitation or clarification of fresh water, precipitation or clarification of mill effluent, lime soda softening, which in fact it was first designed for, and for the separation and recovery of suspended solids in water where solids have been found to justify the cost of recovery.

Some very large installations of the Accelerator are in use in the pulp and paper industry, as for instance, the Chester, Pennsylvania, plant of Scott Paper Company, with a capacity of 12 mgd., and Rayonier Incorporated, Fernandina, Florida, with a 2 mgd. Accelerator lime soda softener which was doing a rather good job of silica reduction, largely due to the high initial content of magnesium. Other late installations are the St. Joe Paper Company and the Brunswick Pulp & Paper Company, Brunswick, Georgia. Particularly interesting is the installation at National Container Co., Jacksonville, Florida, where partly due to the natural properties of the water and partly due to the special properties available in the Accelerator, the water is softened by a process which gives selective calcium carbonate removal. 103 ppm of calcium oxide,

or .086 lbs. per 1000 gal. is added to the water for the softening process, and 166 ppm or 1.29 lbs. per 1000 gal. are recovered from the sludge when this is re-burned, this recovered lime being used for make up in the causticizing system.

Pacific Northwest Problems

- In preparing this paper it was suggested that we might refer to some of the more unusual conditions which had occurred in regard to water treatment on the Pacific Coast and particularly in the Northwest.

Our greatest problem there is probably the removal of color from waters so extremely soft that there are no bases for the formation of aluminum hydroxide, and practically all the required chemical has to be added to the water to absorb the color. We have occasional experiences of iron contents sometimes fairly high, or manganese (usually not in large amounts) and one unusual case was where both iron and copper were present in the water, causing a most unusual color condition and one quite different to treat.

We have, as most of you know, quite a little rainfall on the coast, and one of the problems of many of the water purification plants is caused when the occasional winter snowfall coincides with the Chinook or warm wind, accompanied by heavy rain, when we have snow melting at a very rapid rate at the same time that rain is falling, and the flow in some of the streams becomes out of all proportion to the normal. In one such case the river completely changed its course, and in the new bed, passed through a bed of volcanic silt very finely divided, with the result that the water which flowed to the pulp mill in question was almost in the form of mud. The actual solids were measured at between 6000 and 7000 ppm, and this at a time after the peak of the mud flow had been passed. As a result

the mill had to shut down for several days.

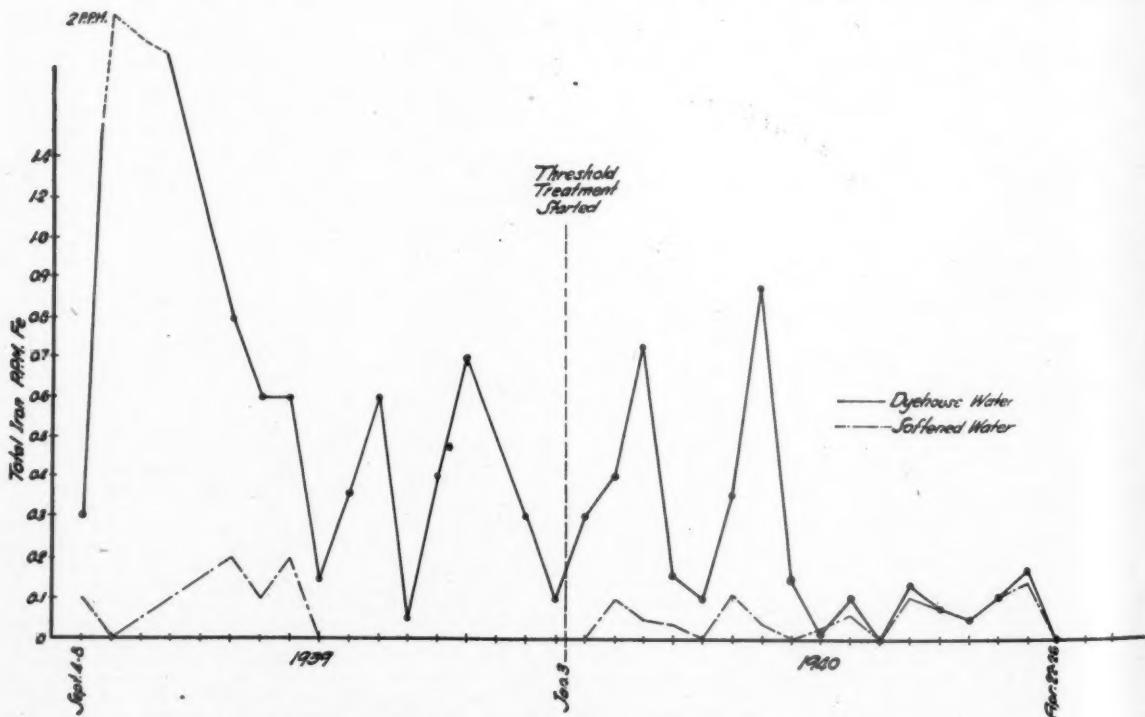
Another unusual case occurred when very heavy summer rains washing out pools in the woods, apparently washed the larvae of some fly into the stream. These were small enough to pass through the screens onto the filters and in some cases passed through the filters. The filters became infested with the larvae and the story was that some passed through to the drying machine and in fact in the heat of the dryers actually developed to a stage where they flew out of the pulp sheet. This is probably a tall tale, but in any event a very active sterilization of the filter beds was necessary to destroy the larvae before filter operations could be resumed.

New Chemicals

- Since we are dealing with the conditioning of water for the pulp mill we would like to refer to the possibilities of some of the chemicals which have become available in recent years, particularly the wetting agents (mostly sulphonated alcohols) which have been used for various purposes, as in felt washing, in the beaters, and in other places throughout the mill, and dispersives of various kinds. These chemicals form a very interesting addition to the possibilities of water treatment.

As a special case we should like to refer particularly to the material known as Calgon, or sodium hexametaphosphate, which has possibilities which distinguish it from any other commercial product with which we are acquainted.

You are probably all familiar with the wetting agents and their action in reducing surface tension of water in such a way that permeation of the fibres is obtained much more rapidly, and this property has been used in various ways in the pulp mill. We propose to describe at



some length the material known as sodium hexametaphosphate or Calgon, which has rather unusual properties, and while it has been and is in use in quite a number of paper mills, it has perhaps not had the publicity which it should have in view of its special qualities.

We understand that an extensive research has been instituted as to the properties of Calgon in pulp and paper manufacturing processes, and the information in this paper has been brought up to date as far as possible. It should, however, be regarded as a progress report, and is not necessarily complete.

Properties of Calgon

• Calgon is a complex phosphate glass produced by a thermal process from soda ash and food-grade phosphoric acid.

The fundamental properties of this glassy phosphate are:

(1) It sequesters many metallic ions in the form of soluble complexes.

(2) It exhibits a pronounced dispersive upon finely divided metal oxides and salts.

(3) It inhibits the crystallization of many slightly soluble salts, stabilizing a condition of super saturation.

(4) It is distinguished from the orthophosphates and pyrophosphates by its ability to coagulate albumen.

(5) Essentially neutral when first dissolved, it reverts slowly to orthophosphate with a decrease in pH value.

The commercial uses of Calgon dependent on these properties are extremely broad in scope, so I will confine my discussion to uses of interest in paper processes.

Dispersive In Paper Coating

• Calgon exhibits a pronounced dispersive action upon finely divided metal oxides and salts. This property of Calgon immediately brings to mind the pigments used in paper coating. An investigation was made as to how Calgon could be used to advantage in the paper coating process where large quantities of pigments are applied to the surface of a paper sheet in connection with some adhesive such as starch or casein. The initial work was largely confined to starch adhesives, as it was believed that this adhesive would find greatest use in the paper machine coating processes, now in use by most of the larger paper coating manufacturers. As time is limited, I will not go into the laboratory procedure used other than to say that they were carried out according to Tappi standards. The Bird Film Applicator was used to coat the paper giving film thickness of .0005" and .0015".

The results of this study show that Calgon has a decided effect on the viscosity of the coating mixes and improves the spreading qualities of the coating. The physical properties of the coated

paper were changed very little with the exception of the Dennison Wax Test which indicated that Calgon improved the adhesive strength of the coating.

Physical Tests were made on the coated paper according to Tappi standards. Different types of clays, pigments and coating starches were used in these experiments. Table I shows a few average examples of the effect of Calgon on the physical properties of coated papers.

The dispersing effect of Calgon on clay, titanium oxide, calcium carbonate, and other metallic pigments is made use of in a number of the coating processes in paper manufacture. The amount of Calgon required depends on the pigment and the type of adhesive used but generally varies from 0.1% to 1.0% on the total weight of solids.

Calgon is also used in coatings containing casein as the adhesive, particularly to improve the spreading properties of the coating mix.

Eliminates Water Hardners

• Calgon sequesters many metallic ions in the form of soluble complexes. This property of Calgon is made use of in all washing or scouring operations such as in the laundry or textile field where lime soap deposits are so detrimental to clean clothes. When soap is added to hard water, the hardness forming salts in the water, calcium and magnesium, precipitate the soap forming insoluble lime soaps as curds or film. If Calgon is added to the water, it immediately sequesters the hardness forming salts in the water into a complex salt, so that when soap is added, there will be no evidence of precipitants and the solution will be clear, with a maximum sudsing effect. Fortunately for you, you do not have this problem in the paper industry, other than in the washing of paper mill felts. Calgon is used in felt washing, to assist the detergent to rapidly and thoroughly impregnate the felt, free the loading material and rinse freely in the final rinsing operation.

A formula has been developed at one of the leading paper colleges which has found wide use in washing felts. This formula consists of Calgon, sodium metasilicate and a sulphonated fatty alcohol.

Felt Washing

• In felt washing it is necessary to rapidly and thoroughly impregnate the felt with a detergent solution which will free the loading material and rinse freely in the final rinsing process. When felts are washed on the machine, the felt is saturated with a spray from the perforated pipe across the width of the felt. A 1% solution is made up in a tank overhead, with the Calgon felt washing compound. The temperature of the solution should be between 100° and 120° F. This solution is sprayed on the felt and the felt

is run with this solution for 20 minutes. Then turn on the showers and rinse for 20-30 minutes.

This washing process puts the felt in a soft and uniformly absorbent condition. It does not have the drawback that a soap compound has, of forming lime soaps, but improves the porosity of the felt. The fibers are kept soft and resilient and a maximum felt life is assured.

Inhibiting Crystallization

• We have a third property of Calgon dealing more with water treatment: this is the property of inhibiting the crystallization of many slightly soluble salts, stabilizing a condition of supersaturation. We commonly refer to this treatment as "Threshold Treatment." By adding Calgon on the order of 1 to 2 ppm. to a high bicarbonate water, the deposition of calcium carbonate scale on heating or addition of alkali is inhibited even in waters containing as much as 30-40 gr. of hardness. This same "Threshold Treatment," with somewhat higher concentrations up to 10 ppm. will inhibit the corrosion of iron pipe lines from soft waters.

The growth of calcium carbonate crystals from a high bicarbonate solution apparently is inhibited with Calgon, by isolating crystal nuclei as rapidly as they form.

The formation of a protective film over iron pipe lines seems to be responsible for the ability of Calgon to inhibit corrosion.

Threshold Treatment of water used in the paper mills inhibits scale formation in pulp washers, pipe lines, vacuum pumps, condensers, heaters, etc. Bleach tanks can be kept more free of scale with the addition of 4-6 ounces of Calgon to a 10,000 gal. tank. Alkaline pulp from the caustic extraction coming in contact with a high bicarbonate wash water will deposit scale on the washers. The addition to Calgon to the wash water to the extent of a 4 ppm. will inhibit this scale deposition.

Threshold Treatment in controlling corrosion is clearly brought out by an experience with a zeolite water in a large mill in Pennsylvania. This water is used for wool dyeing, scouring and bleaching. The pH of the water varied from 6.6 to 8.1 through the seasons of the year, and the hardness varied from 68 to 140 ppm. This hardness however was reduced to 10 ppm. as calcium carbonate through a zeolite softening unit.

As is natural with any soft water there was a decided increase in iron content of the water as it passed from the soft water storage tank to the dyehouse. The dyeing processes provided very sensitive indicators for this iron contamination, since many dyestuffs are affected by even a trace of iron in the water and thus are thrown off shade. Much difficulty was experienced in the dyehouse and it was decided to try to eliminate this trouble.

In September, 1939, a rigorous testing schedule was established at the plant. Samples of softened water and dyehouse water were taken every morning and 100 ml. of each retained to be mixed into a weekly composite. The two composite samples were analyzed to determine the amount of iron picked up in the distribution system.

On January 3, 1940, a feed of 8 ppm. of Calgon into the soft water storage tank discharge was started. This was reduced to 6 ppm. on January 26 and again to 4 ppm. on February 14, then to 2 ppm. on May 1. The results of this treatment can be realized from the iron concen-

TABLE I

Film Thickness	% Calgon on Total Solids	% Solids (Clay)	% Adhesive (Starch)	Brightness	Dennison Wax Opacity Number
(1).0005"	—	50	15	75	96 4
.0015"	—	50	15	76	97 5
.0005"	0.2	50	15	76	96 6
.0015"	0.2	50	15	77	96 7
(2).0005"	—	35	20	76	94 6
.0015"	—	35	20	76	96 7
.0005"	0.2	35	20	75	94 7
.0015"	0.2	35	20	75	95 9
(3).0005"	—	45	15	76	93 3
.0015"	—	45	15	77	96 4
.0005"	0.2	45	15	77	94 4
.0015"	0.2	45	15	78	96 5

trations shown in the following graph for the period before and after the use of Calgon.

The improvement in conditions is evident from the fact that the pick up in iron concentration of the water in passing from the storage tank to the dyehouse has decreased to a negligible amount and the dyehouse has had no trouble with off shades from iron. This is one of several installations that have successfully overcome difficulties from the presence of iron in the water.

Reducing Kraft Chlorine Demand

- Before finishing this paper I would like to bring out another threshold effect

of Calgon in the washing of sulphate pulp after digestion. It is necessary in this application to add more than 2 ppm. of Calgon because of the pulp and large amounts of impurities present. When washing pulp with a dilute black liquor wash followed by two hot clear water rinses, the pulp has a certain bleachability. If Calgon is added to each of the hot clear rinses, .05% based on the weight of the wood—the chlorine demand is reduced as much as 15 to 25%.

In experimental work the pulp was prepared under the following conditions:

Dry Wood Used	3000 g.
Active Chem. as Na ₂ O	20%
Sulphidity	33.3%
Liquor Ratio	5:1

TABLE II

% Calgon Based on Dry Wt. of Wood	Bleachability Test Chlorine Consumed
(1) 0.1%	12.0%
(2) 0.1%	9.2%
(3) 0.05%	8.5%
(4) 0.02%	9.0%

Actual Chlorine Consumption in 3 Stage Bleach	Brightness
5.88%	80
4.41%	80
4.65%	80
4.83%	80
4.74%	80

Cooking Schedule, 1.5 hrs. to reach a max. temp. of 170°C and 3 hrs. at this temp.

The results of washing and bleaching these cooks are given in Table II.

When Calgon is used in the wash, it is assumed that it inhibits the precipitation of the coloring matter in the sulphate pulp so that it is more rapidly washed out. Pulps of higher brightness are produced with a reduction in the amount of chlorine required. Strength values of the pulp washed with Calgon show a small but definite improvement.

Uses Not Fully Explored

I have dealt at some length with this subject because the properties of this material are so varied I feel there must be many uses for it in the pulp and paper mill possibly as yet unexplored. In fact, the purpose of this paper is to suggest the possibilities that newer materials and methods offer to the pulp and paper maker to improve his product through the avenue offered by treatment of the water, which is so large a factor in mill operation.

Newsprint and Pressroom Problems

by U. L. TIPKA*

WITH all factors considered, the average pressroom of relatively modern newspapers today, does a fairly good job of printing with the materials with which it has to work.

As far as newsprint is concerned, a sheet having ample strength, good surface smoothness, contrast brightness, ample absorption capacity, equilibrium moisture, and free from mechanical imperfections, should satisfy most pressroom requirements. From a pressman's point of view, it is reasonable to expect that these factors might be controlled within certain limits. It is entirely up to the paper mill to hold these variable limits to within as narrow a margin as possible. Since the individual sheet characteristics of newsprint vary considerably, regardless where made, it is important to control the trend of variables to minimize pressroom operating problems.

The term standard newsprint as it applies to pressrooms in general is a misnomer. While the newsprint industry might have certain interpretations of this term, the average pressroom has not established a standard. The pressroom, above all, wants a sheet that will print and print well under all conditions. Newspaper requirements vary to fulfill certain pressroom or local conditions. The paper manufacturer is obliged to study these requirements and manipulate sheet characteristics in order to satisfy the conditions.

Qualities Making Good Newsprint

- Strength of paper, as tensile strength, is necessary to satisfy the requirements of the modern high-speed press. It is also necessary on some of the older presses and especially so on some flatbed installations. Problems in newsprint affecting strength are usually materially and quick-

ly adjusted at the mill by increasing the percentage of chemical pulp in the furnish. This procedure is followed only in rare cases when operating problems necessitate additional strength in the sheet. Paper mills endeavor to maintain the percentage of chemical pulp fibre as low as possible in an effort to enjoy certain advantages and by so doing also improve the printability of the paper. Hard, strong sulphite fibre, as used in newsprint, has a tendency to repel ink, similar to the furnish of glassine stock or in some characteristics similar to butcher papers.

The minimum usage of this type of fibre is desired. The quality of wood entering into mechanical pulp has a very marked influence on the ultimate quality and strength of paper. This factor is too often overlooked. Good wood quality not only assures good paper machine operation but is reflected in satisfactory pressroom performance. Wood of low moisture content is converted into a poor grade of mechanical pulp. Newsprint made of low moisture wood lacks pliability, moisture, smoothness, and absorption capacity.

Fillers

- Experiments with various fillers indicate improved printing surface, increased absorption capacity, and increased contrast brightness. In each case, with the fillers a loss of strength has resulted. Experimental runs of newsprint with fillers as high as 24 per cent indicated mullen strength ranging from 18 to 22 per cent. This is too low to satisfy the requirements of high speed presses when one considers the uneven draws through a press from plate to plate. If draws were

uniform and even, possibly paper of lower mullen than this would be satisfactory. As a general rule, satisfactory paper machine and winder operation can be correlated with satisfactory pressroom operation as far as strength of paper is concerned.

Surface Qualities

- The surface of newsprint, both top and wire side, is a paramount problem to the pressroom. The surface should be soft and smooth, and the sheet should be of even thickness. Localized caliper variations cause uneven reproductions. Overcalendering paper in order to obtain smoothness is fundamentally wrong since this causes smudging and offset problems in the pressroom, and where wire conveyors are installed the folded papers do not have sufficient surface friction to cling together. A very soft, smooth finish will permit maintenance of both minimum impression and minimum ink usage. This will assure longer blanket life and greater ink coverage. A hard, thin sheet, while more transparent, will not absorb the ink quickly and will cause a greater amount of offset on the blankets. A hard sheet not only tends to make the first impression look bad; it also permits smearing while going over pipe rollers and will offset going through the folder. It is obviously evident that a softer, smoother and bulkier sheet has a tendency to minimize the above conditions. The variations between the top and wire side of the paper are not only problems of the pressroom; they are primarily problems of the paper mill. Smoothness values of the paper as determined at the mill are not always indicative of the printability of the sheet. Analytical data often indicates the wire side to be smoother than the top, but experience and actual conversion does not justify

*Research Engineer, Hawley Pulp & Paper Company, Oregon City, Oregon. Presented at the 190th meeting of the Oregon Section, American Chemical Society, Heathman Hotel, Portland, March 14th, 1942.

fy the values of the instrument.

Variables existing in surface smoothness between the wire and top side of the sheet also influence the rate of ink absorption on each side. The wire side invariably demands more ink and has greater capacity of absorbing more, too. Various experiments have been tried to entirely eliminate the fourdrinier wire knuckle impression but the results have not been satisfactory. Patented processes are available to minimize this defect but most of them are applicable or favorably practical on slower-running paper machines. It has been customary to run the wire side as the first impression to minimize first impression offset on the blanket; however, this question may be debatable since, while the wire side invariably absorbs ink more quickly, the top side requires less ink to accomplish the same net results.

Moisture a Factor

● Maintenance of uniform equilibrium moisture content of paper is more important than usually realized. Cold, dry air in pressrooms and warehouses causes considerable moisture loss in paper and is directly responsible for many pressroom breaks usually charged to paper quality. Some pressrooms have been found maintaining an atmosphere in the neighborhood of 22 per cent relative humidity. This condition dries out paper quickly, especially where the wrapper is removed the day before the paper is used, and causes cracks and bursts of the paper within the roll. Most large pressrooms spray the ends of rolls with a fine mist of water to relieve the tension on the edge. Many rolls, especially rolls with slight defects on the edge, are salvaged in this manner. Precautions should be taken regarding sprayed rolls when they are left in the press after the run. These rolls should be sprayed well the next day before attempting to start another run. Spraying is especially helpful in the pressroom when the paper mill is experiencing trouble arising from short hair-slivers in the edge of rolls.

Color

● Insofar as color is concerned, whether it be blue-white or cream-white is usually a matter of each publisher's preference. A maximum reflection of light from the paper is usually desired and a minimum amount of light reflection from the ink. This will give the greatest amount of contrast possible, and contrast is what they want today. Dyed paper, especially in the blue-white shade, does lose brightness on being dyed. It is felt, however, greater contrast values are obtained with this shade than with that of cream-white. Cream-white paper, being brighter, also has a tendency to be more transparent, reflecting a higher degree of light from the fibers and permitting a greater percentage of light to pass through. White newsprint, either pigmented or bleached, gives the value to food ads which the advertiser is after. It helps to convey to the general public what the food actually looks like.

Mechanical Defects

● The possible range of mechanical defects or imperfections in roll newsprint is too lengthy to mention. Most defects are culled at the mill and never develop as

pressroom complaints. There are perhaps fifty to seventy-five definite imperfections for which winder crews are authorized to reject paper. The more troublesome as far as pressroom operation is concerned might be mentioned in the following: (1) uneven winding tension which permits rolls to develop lopsidedness, (2) soft edges causing wrinkles through the press and often slurs between impressions, (3) buckles and hard edges also causing wrinkles and slurs, (4) lopsided rolls usually caused by damage or uneven tension during winding, (5) loose cores from bad starts will not permit proper tension being carried at the press reels, and (6) uneven winding which prevents proper color register on color presses. The last mentioned defect is more likely to occur on small width rolls.

Since newsprint is a variable factor in pressroom operation, research applied directly to the pressroom over extended periods of time has indicated a trend of improvement substantiated by the following statistics. Each manipulation in mill operating procedure can be determined over a longer period of time and the trend of future experiments more or less anticipated. The following figures are closely studied and correlated with experimental and operating data of the same period at the mill. Control is maintained to determine how much variation in the essential qualities of newsprint affects its conversion value, and to be able to reasonably trace the variables in these qualities back to the variations in mill processes from which they originate.

Operation Statistics

Total paper, lbs.	1,872,248
Returnable cores, lbs.	10,277
Damaged in storage, lbs.	3,172
Damaged in transit, lbs.	3,374
Operating waste, lbs.	31,255
Paper consumed, lbs.	1,824,170
Black ink consumed, lbs.	37,807
Colored ink consumed, lbs.	156
Paper consumed per unit, lbs.	111.086
Black ink consumed per unit, lbs.	2.284
Paper breaks during press runs	74
Total print, M 8 pp	16,547.1 Units
Spoiled print, M 8 pp	126.0 Units
Spoiled print, per cent	.76
Perfect print, M 8 pp	16,421.1 Units
Basis weight, calculated	31.72
Wrapper, average lbs., per roll	5.84
Total roll changes	1,237
Full rolls used	1,023
Three-quarter rolls used	126
Half rolls used	86

Pressroom Operating Waste Analysis

	Pounds	Per cent
Wrapper, total	7,212	.388
Mixed, all sources	2,619	.141
Strippings, white	2,751	.148
Print and Makeready	14,597	.786
Core	4,076	.219
Total Operating Waste	31,255	1.682

The above tabulation gives a better picture of what is to be accomplished than many series of complaints. From

23 to 27 per cent of press breaks are directly attributable to paper quality; slime, cuts, glue, etc. The above ink figures indicate usage higher than normal which is attributable to war news and increased photo sections. While the total waste of 1.682 per cent is slightly higher than normal, the breakdown analysis indicates where the trouble lies. Core waste is higher than it should be, the average ranging between 0.15 and 0.20 per cent. White stripplings, with good protective roll wrapping, should seldom exceed 0.075 per cent.

The printability of the newsprint made under these test conditions is discussed with the pressroom operating supervisor at frequent intervals. Each edition is examined and compared with press performance records, the latter reports indicating the condition of plates and other variables culminating in the pressroom. With this approach to newsprint improvement, satisfactory progress has been made. Open and frank discussions have reduced the number of problems and created a better understanding between the paper mill and the pressroom.

Other Variables Culminating In the Pressroom

● If newspapers in general are to prosper year after year, they must continue to improve and make both the advertiser and the general public more conscious of their ability to accurately and attractively reproduce copy.

To improve the appearance of the printed sheet is the responsibility of the pressroom. Day after day the pressman receives a multitude of variable products, generally putting out a fairly presentable product. While newsprint remains a problem of paramount importance, there are many other current problems entering into the operation of the pressroom which are equally important individually as the newsprint itself. From the art department to the pressroom many variables creep into an uncontrolled process.

Ink composition is usually uniform; in fact, more uniform than might be expected. Composition is changed from time to time to more nearly meet current demands for better quality. Problems developing from both strike-through and offset are discussed with ink, paper and pressroom representatives at frequent intervals. Certain inks have greater tendency to develop strike-through than others. Continued and increasing use of solids and pictorials results in increased ink usage and reduced coverage. The ratio between solid and printed matter is about four to one, while the ratio of illustrations or pictorials is slightly less than three to one. In order to obtain "punch" many newspapers are using more solids. This procedure increases contrast values but creates additional problems for the ink and paper maker in offset and strike-through. Much offset and strike-through can be avoided if the solid matter is screened but, as just mentioned, the subject will lack "punch."

Humidity is another important factor to be controlled in the pressroom. Controlled humidity will not cure all the trouble but it will prevent moisture loss from newsprint and thereby improve the paper's operating performance. The relationship of air conditioning to rust prevention is another item just as important. While some pressrooms maintain temper-

ature control, the actual control of humidity is often neglected.

Photography is that branch of artwork which contributes materially to the problems of the pressroom. In the majority of cases this contribution is unconsciously developed. There is no other item which loses so much in newspaper reproduction as photography. In an endeavor to exercise more skill and maintain narrower standards in each department of the newspaper today, more is being asked and required of the photographer. The average society section of all newspapers indicates this trend toward better pictures. However, very often the subject of a picture offers no contrast whatsoever, yet complains when reproductions are made in the newspaper. The photographer can help the pressroom by making his prints on pure white, glossy finished paper. On duller paper, tonal values are lost which cannot be regained elsewhere. Pure white prints will help to counteract the gray characteristics of untoned news ink and newsprint stock. As mentioned before, the most important detail for the photographer to watch is the provision of contrast in every composition. The break between shades should be sharp and definite for the best results from the pressroom. Where light cannot be controlled, contrast should be provided with light or dark objects. Backgrounds may be outlined or entirely eliminated where sufficient contrast is not obtained. When the pressroom receives a dark subject against a dark background, the subject is ultimately lost against the dark background because further loss of detail is encountered due to the quality of news ink and newsprint.

There are many ways for the engraver to help the product of the pressroom, yet, on a paper printed as well as the New York Herald-Tribune, Mr. Arthur H. Burns, mechanical superintendent, once stated, "Engravings now come for printing with various depths, with various sizes and shapes of dots and with no certainty that the subject is reproduced beyond the capacity of the mechanics employed. It is a requisite for better printing of illustrations that engravings be deeply etched and that the different tones be reproduced faithfully to the copy." Since the Herald-Tribune has been judged one of the best printed newspapers in the United States, it appears reasonable to assume defective engravings add to the many problems of the pressroom in other localities too. Speaking of the mechanics employed, the great need is good materials plus a "little imagineering." Under-etched or under-cut plates make it practically impossible for the stereotyper to make good mats. If the bottom of the bite on the zinc plate is not clean, it will be transferred to the mat and thence to the plate and cause "smearing" on the presses. Deep etched plates are necessary, especially in the range of halftones approaching the solid. The necessity for this is mighty important when you visualize the amount of depth lost in newspaper printing as a result of the many removals from the original halftone to the final stereotype plate on the press. Cleaner, clearer and more attractive reproductions are being obtained by printing direct from curved zinc plates in 85-line screen. In this work on newspapers, it is most important to have rubber oscillating from rollers and have newsprint free from dirt and lint.

To give a real snappy appearance to the printed sheet, it is imperative that new type never be mixed or allowed to intermingle with old, worn type. Old type or matrixes will cause spotty and uneven contrast with the new type and will distract from the orderly appearance of the rest of the sheet. The compositor must watch his fountains and replace those worn below type high. Metal temperature and formula are important in type setting machines and the level in the pot must also be watched. Heavy type matter should be burnished to obtain maximum solid in printing. This is too often overlooked and gives to the printed paper the appearance of "picking," too often maintained to be a paper defect.

As work flows from the art department to the stereotype room, each and every little imperfection is being accentuated. The stereotype room can add nothing but further problems when the defect is still in the form. Correct molding, mats, packing, shrinking and casting do not eliminate imperfections once in the copy at the start. New developments in mats, molding machines, shrinking equipment, vacuum casting boxes and printing direct from zinc plates have improved materially the quality of work from the stereotype room and have lessened the problems of the pressroom. Maintaining correct metal formulation and controlling temperature are still problems and may develop into still greater problems with priorities in force. Some stereotype rooms have standardized on one thickness of mat, while others vary the thickness to compensate for the form matter, classified taking the thinner mats in order to get maximum shrinking. Packing of the mats does not always receive the attention it should. Packing a mat takes time and time is usually an important item. Sprung plates will always cause the pressroom trouble and might be eliminated with careful inspection of stereotype equipment. Open ads should be packed thoroughly but not overpacked. Plates are usually distorted through improper handling and particularly where plate conveyors are not installed. Temperature of the metal, its formula, uniformity in cooling the mold and worn molds are all contributing causes of sprung plates.

Presswork itself is primarily that of adjusting ink and impression to a sheet of newsprint passing between the blanket cylinder and the plate. Tension is carried on the reels while draws are tightened into the former. It is perhaps the simplest operation of the newspaper to visualize, if we do not observe the problems. Strike-through, show-through and first impression printing have been problems of long standing. Color register and depth of shade add to the problems as well as to waste. Experiments with blankets are usually being tried to determine the ones giving maximum resiliency and the longest life. Care of rubber rollers, best type rubber rollers and regrinding of rubber rollers always have the attention of the pressroom supervision. Ink coverage and waste reduction, as well as unit combinations for the daily run, add many more problems.

Due to the many complex factors involved and to the very nature of the work itself, newspaper standardization has not kept pace with the progress of other industries. There are many factors which enter into this phase of development which are beyond the control of the me-

chanical superintendent. With the possible exception of the press itself, the pressman has very little control over the materials entering into his work. Paper, ink, blankets, rollers, lubrication, color and all the materials from the engravings to the stereotype plate are variables which he accepts upon recommendation. It is obviously the responsibility of the various departments and manufacturers supplying the pressroom to coordinate their efforts in improving and standardizing their products.

Acknowledgment

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Sid Collier Vacations In Washington

• Sid Collier, shift foreman, Puget Sound Pulp & Timber Co., Bellingham, took his vacation last month and saw a good part of the State of Washington. Accompanied by Mrs. Collier, he first attended the Joint Meeting of the Superintendents and TAPPI in Portland.

Afterward they drove through the Blue Mountains, visited in Walla Walla and Spokane, saw the water running over Grand Coulee Dam, and rested at Lake Chelan.

Everyone ought to see Grand Coulee now, Sid reports, for the sight of the enormous volume of water going over the dam is truly magnificent.

May Newsprint Production Below Year Ago

• Production in Canada during May, 1942, amounted to 251,831 tons and shipments to 266,443 tons, according to the News Print Service Bureau. Production in the United States was 80,040 tons and shipments 76,612 tons, making a total United States and Canadian newsprint production of 331,871 tons and shipments of 343,055 tons. During May, 24,995 tons of newsprint were made in Newfoundland, so that the North American production for the month amounted to 356,866 tons. Total production in May, 1941, was 404,204 tons. There was one more working day in May, 1941, than in May, 1942.

The Canadian mills produced 67,975 tons more in the first five months of 1942 than in the first five months of 1941, which was an increase of five per cent. The output in the United States was 29,639 tons or six and eight-tenths per cent less than in the first five months of 1941, in Newfoundland production was 11,826 tons or eight and one-tenth per cent less, making a net increase of 26,510 tons, or one and four-tenths per cent more than in the first five months of 1941.

Stocks of newsprint paper at the end of May were 169,409 tons at Canadian mills and 16,076 tons at United States mills, making a combined total of 185,485 tons compared with 196,669 tons on April 30, 1942, and 187,571 tons at the end of May, 1941.

The Catalytic Hydrogenation Of Sulfonated Lignin

by ROBERT J. LOVIN and LEO FRIEDMAN*

Introduction

ALTHOUGH the non-carbohydrate portion of woody tissue has been called lignin for over 100 years^{22, 51}, most of the experimental work on this substance has been done during the past 30 years. Present day interest in lignin exists for two reasons. These are (1) that in the acid pulping processes the lignin is a waste material the disposal of which presents a serious problem, and (2) that because of its aromatic character lignin may prove a valuable source of chemical raw materials comparable to those obtained from coal tar.

A large part of the chemical work on lignin has been carried out on material isolated from wood by extraction with alcohols^{3, 9-11, 15, 18-21, 23-4, 26-8, 52} and other solvents^{13-4, 47-8} or by hydrolysis of the carbohydrate part of the wood with concentrated acids^{12, 38, 54}. These studies have involved chemical analyses of the products, the preparation of derivatives, and studies of the thermal decomposition of lignin under a variety of conditions. Because of particular interest in waste sulfite liquor, parallel studies have been made on waste sulfite liquor solids and on sulfonated lignin obtained by separation of the carbohydrate and inorganic materials present in the liquor^{25, 37, 40}.

These studies have given the chemist an incomplete picture of the nature of lignin, but one that has served to stimulate further research. Some confusion has existed

because of differences resulting from variations in method of isolation and from actual differences in lignins in various woods.

The presence of methoxyl and hydroxyl groups has long been recognized and many aromatic substances have been isolated from lignin. Klason was the first to propose that lignin may be a condensation product of coniferyl alcohol⁴¹ or aldehyde³⁹. More recently Freudenberg¹⁷ has suggested that lignin may be a product resulting from the etherification and condensation of the units in Figure 1. This theory allows for wide variation in lignin from different sources.

During the past few years, catalytic hydrogenation, a process that has proved of great value in work on organic compounds in general, has been carried out on lignin with a view toward learning more about its structure and possible utilization. Much of the work has been done on lignin prepared in the laboratory and only a very little on commercially available lignin. Since it appeared to the authors that the chief interest in utilization of lignin centered around the disposal of waste sulfite liquor, it was decided to study the hydrogenation of sulfonated lignin from this source in spite of the apparent difficulties that were certain to be encountered. Chief among these was poisoning of the catalysts by sulfur contained in the material to be hydrogenated. The preliminary studies reported here involved an attempt to find conditions and catalysts that would give a satisfactory degree of hydrogenation and a study of the products of such hydrogenations.

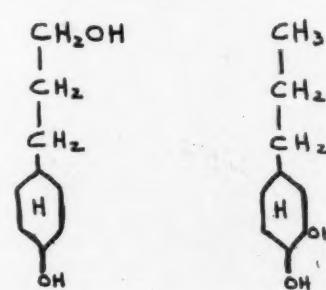
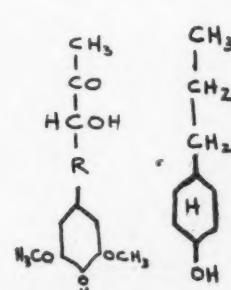
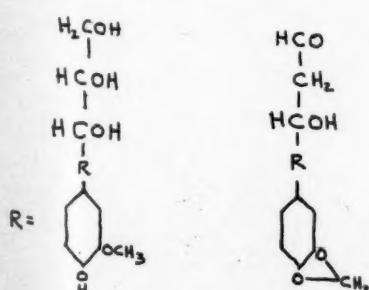
The Hydrogenation of Lignin

It seems best to pass over much of the early work on hydrogenation of lignin and lignin containing materials^{4, 8, 16, 33, 35-6, 49-50, 53}, but to describe briefly the outstanding studies carried out at the U. S. Forest Products Laboratory and the University of Wisconsin. Harris, D'Ianni, and Adkins in 1939³⁰ hydrogenated methanol lignin obtained from aspen wood using copper-chromium oxide catalyst. The reaction was carried out in dioxane at 250-260° under 200-350 atmospheres of hydrogen over a period of 18 hours. Twenty-seven and five-tenths per cent of the lignin was recovered as methanol and 40 per cent was found to consist of the three propylcyclohexane derivatives in Figure 2.

In a later paper Harris and Adkins²⁹ showed that the same products could be obtained in about the same yields from methanol, hydrochloric acid, alkali, and sulfuric acid lignins.

Harris and Sherrard³² have obtained a patent for the simultaneous pulping of wood and hydrogenation of the lignin in aqueous alkaline solution using Raney nickel catalyst. The pulp obtained without further purification was about the color of newsprint, was quite free from shives and easily bleached by a mild treatment with chlorine. Methanol, propanol, and propylcyclohexane derivatives were obtained as by-products.

In a later publication Harris and Sherrard³¹ have discussed their experimental work on hydrogenation in aqueous medium. They have used methanol, soda, sulfuric acid, and cellosolve lignins and have obtained



*Department of Chemistry, Oregon State College, Corvallis, Oregon. Presented at the annual Joint Meeting of the Pacific Coast Division of the American Pulp & Paper Mill Superintendents Association and the Pacific Section of TAPPI, Portland, Oregon, June 6th and 7th, 1941.

similar products from each, chiefly methanol and propylcyclohexane derivatives.

Still more recently Adkins² has made a study of the hydrogenation of a commercial soda lignin in dioxane solution over copper chromium oxide catalyst. Sufficient difference was found in the products obtained with soda lignin as compared with those obtained when methanol lignin was used, to lead Adkins to conclude that in methanol lignin units related to propyl benzene are joined in chains, while in soda lignin cyclization has taken place during the process of isolation.

Among the earlier studies on hydrogenation of sulfonated lignin from waste sulfite liquor should be mentioned the work of Lindblad in 1930-31⁴⁻⁶ who obtained Swedish patents for the production of aromatic compounds from waste sulfite liquor by hydrogenation. Patents for the hydrogenation of waste sulfite liquor have also been issued to Bergstrom and Cederquist⁵⁻⁶ in Sweden and International Hydrogenation Products, Ltd.³⁴ in France. Two Russian workers, Bobrov and Koltova⁷ have also made studies on the hydrogenation of waste sulfite liquor after previously acidifying and passing in steam to remove about half of the sulfur.

Experimental

The waste sulfite liquor used in these experiments was obtained through the courtesy of the Pulp Division of the Weyerhaeuser Timber Co., Longview, Wash. To obtain the lignin sulfonate, the waste liquor was neutralized with sodium carbonate, the precipitated calcium salts removed by filtration, and the carbohydrates separated from the lignin by use of a counter current dialyzer (loaned by Research Department, Pulp Division Weyerhaeuser Timber Co.).

The Raney nickel and copper-chromium oxide catalysts were prepared by the procedures described by Adkins.¹ Molybdenum oxide was prepared by passing hydrogen sulfide into a boiling solution of ammonium molybdate, acidifying with sulfuric acid and continuing the addition of hydrogen sulfide. The precipitate was finally ignited in air. Nickel sulfide was prepared by precipitation with hydrogen sulfide from a boiling solution of nickel nitrate.

All hydrogenation experiments were carried out in a Parr high pressure hydrogenator. The bomb was shaken for the entire period and the temperature maintained constant by

means of a thermoregulator. In each experiment the bomb was charged with the lignin containing material, catalyst, 6 g. of sodium hydroxide, and enough water to make total volume 200 ml.

Experimental Results

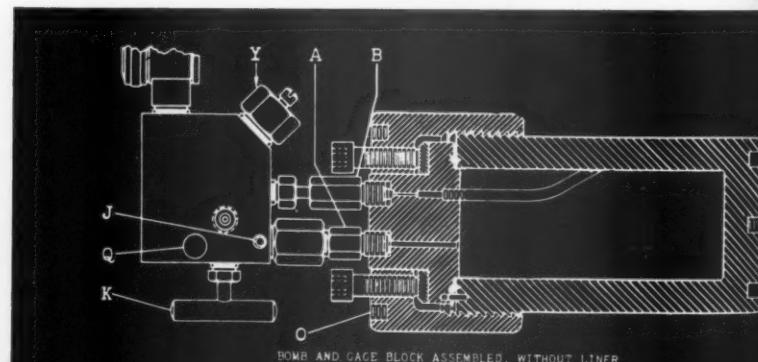
Several attempts were made to hydrogenate the lignin sulfonates using Raney nickel as the catalyst. As was expected, since Raney nickel is very easily poisoned by sulfur, it was found that this catalyst would not serve to bring about hydrogenation. Refluxing the lignin compounds with Raney nickel at atmospheric pressure did not remove enough sulfur to make possible the later use of this catalyst in the hydrogenation reaction.

Other catalysts tried were nickel sulfide, tetralin, molybdenum oxide, and copper-chromium oxide. With the last two catalysts hydrogen was taken up during the reaction, one mole of hydrogen by 80 g. of the lignin sulfonate in the case of molybdenum oxide and by 70 g. of lignin sulfonate in the case of copper-chromium oxide. In all these experiments initial pressure of hydrogen was about 130 to 140 atmospheres and temperature of bomb was maintained at 260-270° which caused pressure to rise to about 230-240 atmospheres.

In some of the preliminary experiments with copper-chromium oxide the temperature was raised to 400-410° and since qualitative examination of the products of these experiments indicated more oily and resinous materials present, these conditions were selected for further study.

A total of 240 g. of lignin containing material was accordingly hydrogenated over copper-chromium oxide at 400-410° and maximum pressure of about 300 atmospheres. One mole of hydrogen was absorbed by about 75 g. of lignin sulfonate. After separation of the catalyst and insoluble residue from the solution, 17 g. of ether soluble material were recovered from the residue 50 per cent of which upon fractional distillation was recovered as oily material boiling at about 75° (1 mm.) 5 g. and a solid distilling at about 150° (1 mm.), 3 g. The oily distillate varied in color from colorless to light yellow to red. These two fractions were later recombined and redistilled in a low-boil up column. No thermometer was used but refractive index of small samples indicates that a complicated mixture of compounds was present.

A yellow oily material and an acid were separated from the solution. Attempts to identify the acid by formation of its anilide and phenyl-



The following parts are designated by letter on the photographs and in the above sketch. It is suggested that the user become familiar with the operation of each, before proceeding to use the apparatus.

A - Safety Plug	N - Lift-Out Handle
B - Bomb-Gage connection	O - Lift-Out Handle Socket
C - Gage-Coil Connection	P - Pin Wrench
D - Low Pressure Supply Connection	Q - Pin Wrench Socket
E - High Pressure "	R - Bomb Retainer Bolt
F - Tube Fitting	S - Line Outlet
G - "	T - Heater Cord
H - "	U - Motor Switch
J - Gage-Block Set Screw	V - Thermocouple
K - Gage-Block Valve	W - Thermoregulator Knob
L - Booster-Block Valve	X - Relay Cut-out Knob
M - To Cylinder Valve	Y - Vapor Trap

phenacyl bromide gave results that were inconclusive. No methanol could be recovered.

In a series of experiments now under way 270 g. of lignin sulfonate have been hydrogenated over copper-chromium oxide in aqueous solution containing 3 per cent sodium hydroxide at temperatures of 260-270° and maximum pressures of 230-240 atmospheres. After separating the catalyst by centrifuging, the solution has been rehydrogenated over Raney nickel under similar conditions. The nickel catalyst was then separated and the solution hydrogenated once more over Raney nickel. In this triple hydrogenation total hydrogen absorbed was one mole per 40-45 g. of lignin sulfonate.

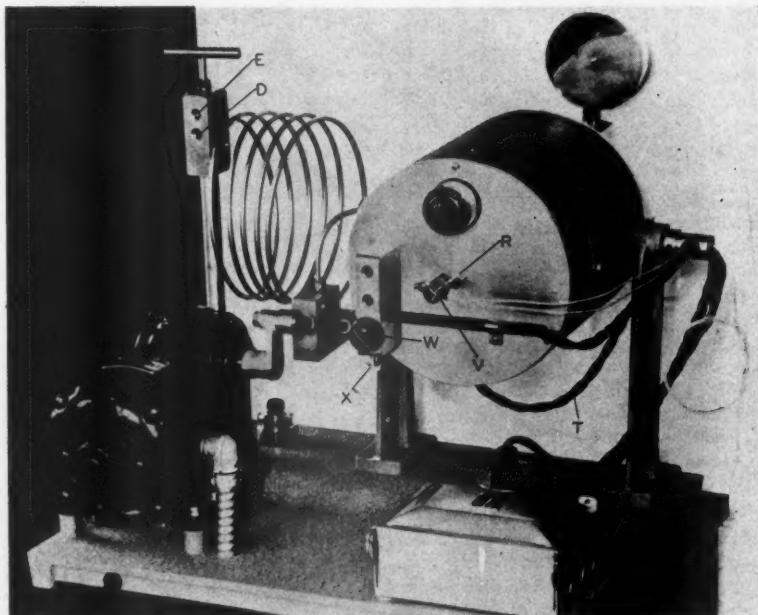
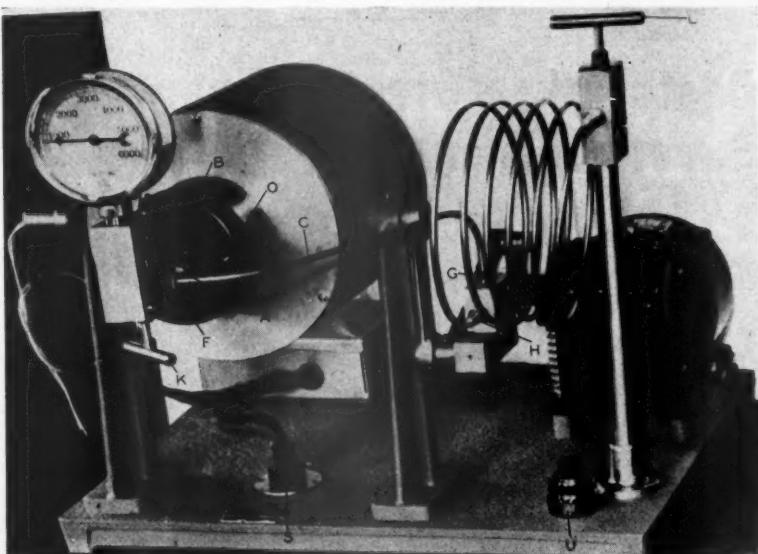
Evidently after hydrogenation of the lignin sulfonate with copper-chromium oxide catalyst, the material can be further hydrogenated over Raney nickel. Although examination of the products of these experiments is still incomplete, all indications are they will be similar to those previously obtained. It is expected that identification of some of the products will soon follow.

Since this work is still being continued, we hope at a later date to be able to tell you more definitely whether or not we can add to the knowledge of the nature of sulfonated lignin by a study of its hydrogenation and whether or not such a process might be used in a commercial utilization of waste sulfite liquor.

Although burning of waste sulfite liquor solids may offer a more immediate solution to the problem of disposal, a method of utilization of this source of aromatic compounds seems the more desirable ultimate goal. Such utilization must await further studies on the chemistry of lignin and hydrogenation promises to be one of the most valuable tools available for such studies.

Bibliography

- ¹Adkins, H., Reactions of Hydrogen, 13, 20. Madison, U. of Wisconsin Press, 1937.
- ²Adkins, H., Fran, R. L., and Bloom, E. S., J. Am. Chem. Soc., 63:549 (1941).
- ³Bailey, A. J., Paper Trade J., 109:29 (1939).
- ⁴Bailey, A. J., Pacific Chem. Met. Ind., 4:13 (1940).
- ⁵Bergstrom, H., and Cederquist, K., Iva 3:64 (1932).
- ⁶Bergstrom, H., and Cederquist, K., Swedish patent 82, 615 Feb. 19, 1935.
- ⁷Bobrov, P. A., and Kolotova, J. I., Compt. rend. acad. sci. URSS. 24:46 (1939).
- ⁸Boomer, E. H., Argue, G. H., and Edwards, J., Can. J. Research, 13 B: 323 (1935).
- ⁹Brauns, F., J. Am. Chem. Soc., 61:2120 (1939).
- ¹⁰Brauns, F., and Hibbert, H., J. Am. Chem. Soc., 55, 4720 (1933).
- ¹¹Brauns, F., and Hibbert, H., Can. J. Research, 13:28 (1935).
- ¹²Brauns, F., and Hibbert, H., Can. J. Research, 13:78 (1935).
- ¹³Buckland, I. K., Brauns, F., and Hibbert, H., Can. J. Research, 13:61 (1935).
- ¹⁴Buhler, F. A., Zangew. Chem., 11:119 (1898).
- ¹⁵Campbell, W. G., Biochem. J., 23:1225 (1929).
- ¹⁶Fierz-David, H. E., and Hanning, H., Helv. Chim. Acta., 8:900 (1925).
- ¹⁷Freudenberg, K., Annual Rev. Biochem., 7:81 (1939).
- ¹⁸Friedman, L., and McCully, C. R., Paper Trade J., 107:28 (1938).
- ¹⁹Friedrich, A., and Bruda, B., Monatsh., 46:597 (1925).
- ²⁰Friedrich, A., and Diwald, J., Monatsh., 46:31 (1925).
- ²¹Fuchs, W., Ber., 62:2125 (1929).
- ²²Gortner, R. A., Outlines of Biochemistry, p. 716, New York, John Wiley and Sons, 1938.
- ²³Gray, K. R., King, E. G., Brauns, F., and Hibbert, H., Can. J. Research, 13:35 (1935).
- ²⁴Gruss, J., Ber. botan. Ges., 38:361 (1921).
- ²⁵Hagglund, E., and Carlson, G. E. Biochem. Z., 257:467 (1933).
- ²⁶Hagglund, E., and Rosenquist, T., Biochem. Z., 179:376 (1926).
- ²⁷Hagglund, E., and Urban, H., Cellulosechemie, 8:69 (1927).
- ²⁸Hagglund, E., and Urban, H., Cellulosechemie, 9:49 (1928).
- ²⁹Harris, E. E., and Adkins, H., Paper Trade J., 107:38 (1938).
- ³⁰Harris, E. E., D'Iannin, J., and Adkins, H., J. Am. Chem. Soc., 60:1467 (1938).
- ³¹Harris, E. E., Saeman, J., and Sherrard, E. C., Ind. Eng. Chem., 22:440 (1940).



- ²²Harris, E. E., and Sherrard, E. C., U. S. Patent 2,146,655, Feb. 7, 1939.
²³Hatihama, Y., Zyodas, S., and Umez, M., J. Soc. Chem. Ind. (Japan).
²⁴International Hydrogenation Products, Ltd., French patent 834,204, Nov. 16, 1938.
²⁵Ipatiev, V. N., and Petrov, A. D., Ber., 62 B: 401 (1929).
²⁶Isobe, H., Tanaka, K., and Ito, K., Japanese patent 113,602, Dec. 9, 1935.
²⁷King, E. G., Brauns, F., and Hibbert, H., Can. J. Research, 13:88 (1935).
²⁸Klasen, P., Cellulosechemie, 4:81 (1923).
²⁹Klasen, P., Ber., 53:706 (1920).
³⁰Klasen, P., Arkiv. Kemi. Mineral. Geol., 6:15 (1917).
³¹Klasen, P., Svensk Kem. Tid., 9:135 (1897).
³²Lindblad, A. R., Ing. Vetenskaps Akad. Handl., 107:7 (1931).
³³Lindblad, A. R., Swedish patent 73,301, Dec. 22, 1931.

- "Lindblad, A. R., Swedish patent 71,006, Jan. 27, 1931.
³⁴Lindblad, A. R., Swedish patent 70,589, Nov. 11, 1930.
³⁵Lindblad, A. R., Swedish patent 69,897, July 29, 1930.
³⁶Marshall, H. B., Brauns, F., and Hibbert, H., Can. J. Research, 13:103 (1935).
³⁷Mehta, M. M., Biochem. J., 19:958 (1925).
³⁸Moldavskii, B. L., and Vainshtein, S. M., Khim. Tverdogo. Topliva, 6:656 (1935).
³⁹Morell, J. C., and Egloff, G., Ind. Eng. Chem., 21:537 (1929).
⁴⁰Phillips, M., J. Wash. Acad. Sci., 30:65 (1940).
⁴¹Rassow, B., and Gavriel, H., Cellulosechemie, 12:227, 249, 290, 318 (1931).
⁴²Trefil'ev, I. A., and Filaretov, A. N., Ukrains. Khem. Zjur., 10:450 (1935).
⁴³Willstatter, R., and Zechmeister, L., Ber., 46:2401 (1913).

Death Takes Grant Farmer Superintendent at Vernon

● U. Grant Farmer, superintendent of the Vernon Division of Fibreboard Products Inc., died of a heart attack in his sleep the morning of July 1st. Funeral services were in charge of the Southgate Lodge F. & A.M., of which he had been a member for many years. Cremation followed the services at Pierce Bros. mortuary on July 3rd, and his ashes were placed in a niche in the columbarium at Forest Lawn in Los Angeles.

Mr. Farmer lived a most active life up to his death. Early in June he attended the joint meeting of the Superintendents and TAPPI at Portland, playing in the golf tournament. On June 18th, as the newly elected chairman of Paper Makers and Associates of Southern California, he presided at his first meeting. A photograph of the group appears in this issue.

Ulysses Grant Farmer was born in Uniontown, Pa., August 3, 1885. At the age of 16 he began his paper-making career at Noblesville, Indiana. In 1906 he came to the Pacific Coast and worked for the Crown Willamette Paper Company at Camas, Washington, throughout 1907. The next year he moved to Antioch, California, to work for the California Paper and Board Mills, a division of the Paraffine Companies, now the Antioch Division of Fibreboard Products Inc.

Early in 1909, Grant Farmer became a machine tender for the Los Angeles Paper Manufacturing Co., now the El Rey Products Company.

Returning to Antioch in 1912 he worked there until the mill was destroyed by fire on November 12th of that year. For a short time he kept busy as an electrician but went back to Antioch when the mill was rebuilt in 1913.

On September 1, 1915, he moved to Los Angeles to remain the rest of his life with the Fibreboard mill at Vernon. His first job was on the sheet liner. Later he became machine tender, then boss machine tender and in 1926 Grant Farmer was made superintendent of the board mill, continuing in that capacity until his death. He was a member of the American Pulp & Paper Mill Superintendents Association.

He leaves his widow, Vivian, living at 4455 Springdale Drive, Los Angeles, and three children, a daughter Lois, and two sons, Richard and Billy.

Grant Farmer loved people and his cheerful, friendly nature won him a wide circle of friends not only in Los Angeles but throughout the industry.

E. G. Drew, Chief Engineer Hesse-Ersted Iron Works

● E. G. "Sid" Drew has been appointed chief engineer of the Hesse-Ersted Iron Works, Portland, according to an announcement by Kenneth B. Hall, president of the company.

Mr. Drew took over his new position late in June. For the past several years he has been in business for himself under the firm name of Drew & Hoffman. He will continue handling engineering jobs for the pulp and paper industry.

Wood Pulp Allocation Order Interpreted

● An interpretation of General Preference Order M-93, which directs the distribution of wood pulp to consumers under an allocation system, has been issued by the Director of Industry Operations to clarify certain points with respect to administration of the order.

The interpretation, No. 2, is designed to make plain the following:

That wood pulp, the distribution of which is regulated by M-93, does not include paper or paperboard side runs.

That monthly reports on consumption inventory and estimated receipts, which must be filed with the WPB on Form PD-291, should include side run paper or paperboard when retained or disposed of for use in the manufacture of papers, paperboard or paper products.

That a delivery of wood pulp is considered to have taken place when the pulp has been placed in the hands of a carrier or any other form of transit, regardless of the time when the person to whom it is to be delivered receives it.

That delivery, under monthly allocations, may be made within three days before the first of the month specified or three days after the end of that month.

That filing of orders for wood pulp with producers on Form PD-290 means that the form should be placed in the mails or other means of delivery in time to reach the producer not later than the 5th day of each month.

That filing shipping schedules with WPB on Form PD-292, which must be received by WPB on or before the 15th day of each month, means placing this form, together with copies of Form PD-290, in the mails in time to reach WPB not later than the 15th of each month. That whenever the Director of Industry Operations approves a delivery of pulp, the approval automatically includes authority to make minor adjustments in the quantities of pulp to be delivered so that full carloads may be shipped. In the past, it has been found that some shipments have fallen slightly short of a full carload, and it is necessary to adjust this situation so that efficient use can be made of available transportation facilities.

Pacific Paperboard Enlarges Machine Shop

● The machine shop of Pacific Paperboard Company, Longview, Washington, is being moved into the old egg-filler department of the mill. The advantages of the move are to place the shop in a more central location and to enlarge the shop space between six and seven times. In the past the equipment has been rather cramped for space and large jobs were rather difficult to handle. In the new location it is expected that the shop's capacity can be increased and work handled more conveniently.

Other shop improvements include the changing of the lathes from a line shaft drive to individual motor drives.

Fifteen Camas Men Join Armed Forces In June

● During the month of June fifteen employees of Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington, left for the armed forces. Nine of these went with the army, five joined the navy and one the coast guard.

Pulp and Paper Branch Losing Four Men

• The Pulp and Paper Branch of the War Production Board is losing four of its best men, according to George Riley, columnist for the Washington Times-Herald. In his July 1st column he wrote:

"One of the smoothest functioning activities in War Production Board is the pulp and paper branch, which was preparing for war long before Pearl Harbor. The pulp industry, fifth largest in the United States, had a trying period along with other industries affected by the war. In general, however, its problems have been carried through successfully by a group who did not stop at half measures.

"The branch is losing four of its best men, Walter West, Ky Taylor, Rudolph Germanson, and Thomas Sheppard. Sheppard is joining up with OPA, where problems of price control still are on the increase. The others are resuming their respective places in the industry. There still remain Charles Boyce, George Lee, J. A. Grant, David Graham, and Peter B. Andrews, research adviser to David J. Winton, chief of the branch."

The Ky Taylor mentioned is F. G. Taylor of Rayonier Incorporated.

Tucker of Lebanon Receives 30-Year Pin

• Vern Tucker, for more than 30 years an employee of the Crown Williams Paper Company, Division of Crown Zellerbach Corporation at Lebanon, Oregon, was awarded a 30-year service pin late in May.

The presentation was made by Paul Middlebrook, resident manager, just prior to his leaving for San Francisco to work temporarily in the industrial relations department.

Mr. Tucker received a letter of congratulations from J. D. Zellerbach, president of the corporation, which read as follows: "Please accept my congratulations on attaining the thirtieth year of your experience with Crown Zellerbach Corporation, and my hope that ensuing years will find our association mutually satisfactory.

"In these war days, when younger men of our organization are exchanging their working clothes for military uniforms, there is a current need for training newer hands to fill their positions until after the war is over. This places an added responsibility on those of us who have had long experience with the company. Together we must give the benefit of our counsel and tolerance in the fitting of these more recent arrivals into the job they face in working as a team for the production of pulp and paper products so vital to the war program. I feel certain that your long experience will be helpful to these newer associates. With best wishes (signed), J. D. Zellerbach."

Mr. Tucker, in addition to his work at the mill owns a service station and takes an active part in Lebanon civic affairs as a city councilman.

Richard Allez Married In Bellingham

• Richard Allez, pulp grader for the Puget Sound Pulp & Timber Co., Bellingham, was married recently to Miss Florence Williams of Vancouver, B.C., the ceremony being performed in St. Paul's Episcopal Church in Bellingham.

Mr. Allez is known as one of the best musicians among the Puget Pulp men.

W P B Outlines Policy Toward Pulp and Paper

• The Pulp and Paper Branch of the War Production Board issued, the middle of June, the following informative bulletin to the pulp and paper industry, relating to material priorities assistance:

The number of applications for priorities processed by the Pulp and Paper Branch has almost doubled since January. This increase in the number of applications for critical materials may be attributable to one or more of the following causes:

(1) Inadequacy of the P-100 blanket A-10 rating due to growing shortages of materials;

(2) Desire to build up inventories and acquire spares for protection against emergencies;

(3) Desire to expand or improve productive facilities.

The War Production Program is now at a critical stage of its development. More and more it will be necessary to divert critical materials from civilian industry to direct war production. Obviously, the pulp and paper industry must share the burden in this program of conversion to war production. It can do so by restricting applications for preference ratings to the very minimum necessary for essential maintenance and repair.

For the guidance of applicants, the basic policies in the light of which applications for material priorities are weighed have been listed and are presented herewith. Before requesting priorities assistance, prospective applicants should determine whether they are eligible for assistance under the basic policy principles set forth in the following statement.

Priorities Policy on Critical Materials for the Pulp and Paper Industry

I. Expansion

• Requests for priorities for materials to be used for the expansion of productive facilities will be denied, except as expansion may in the future be specifically requested by the War Production Board.

II. Major Improvements

• Major improvements requiring critical materials should be postponed for the duration even though postponement may mean a loss of production. Preference ratings will be denied, unless the improvement may in the future be specifically requested by the War Production Board.

III. Maintenance and Repair

• Priorities assistance will only be available for minimum maintenance and repair requirements. Substitutes for critical materials must be specified wherever practicable. A substitute will not be deemed impracticable merely by virtue of the fact that it is inefficient or uneconomical.

In certain instances, however, it may be necessary to prohibit the use of un-fabricated scarce materials for repairs in less essential plants.

IV. Emergencies

• To offset the strict priorities policy applicable to inventories and "spares," emergency priorities aid will be available in the event of sudden breakdowns resulting in complete or partial shutdown. Applicants in requesting emergency aid

should report the following data to the War Production Board by telegram: (1) Character of the emergency (2) Repair Materials required (3) Value (4) Order Number (5) Supplier's name and address (6) Rating required to assure immediate delivery.

This procedure should be followed only in the event of a genuine emergency of a serious character and only in cases where there has been a complete or partial shutdown.

V. Inventories of Maintenance and Repair Parts

• All applications for maintenance and repair parts should indicate current inventories in terms of quantity and days' supply. If inventories exceed a practicable working minimum, preference ratings for additional supplies will be denied. There should be rigid compliance with the inventory restrictions of Priorities Regulation No. 1 and Preference Rating Order P-100.

VI. "Spares"

• Applications for ratings on spare motors, pumps and other pieces of critical equipment will, in general, be denied. Policy favors the granting of high ratings on an emergency basis for the prompt repair of equipment that has failed. This policy may result in an occasional loss of paper production in particular plants, but under present circumstances this factor is outweighed by the need for critical materials and equipment in the war program.

VII. Substitutions

• Applications for preference ratings will only be approved when it appears that the applicant has explored the possibility of substitute materials and has selected the least critical materials suitable for the purpose at hand. Relative serviceability will be only an incidental consideration. The basic economic consideration will be one of critical materials rather than money.

VIII. Second Hand Materials

• Under L-83 a preference rating of A-9 or higher must be obtained to secure the release of second hand pulp or paper making machinery valued at over \$1,000 and paper converting machinery valued in excess of \$200. Policy will be liberal in granting the preference ratings necessary to release such second hand materials.

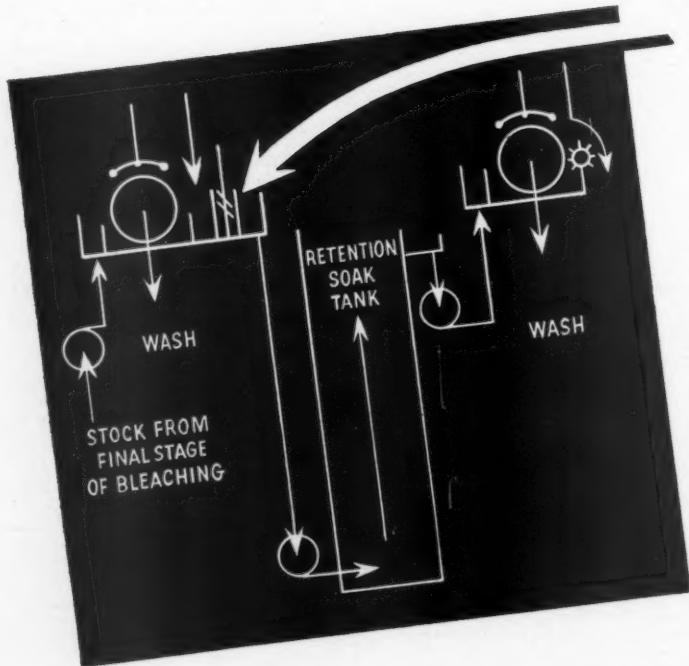
The Pulp and Paper Branch maintains a file of used pulp and paper machinery and equipment against which mills are invited to check their requirements. In addition, the Salvage Section of the Inventory and Requisitioning Branch of the War Production Board has available an extensive file of used industrial machinery and equipment.

Wegner Transferred To Central Technical Dept.

• W. E. Wegner, formerly of the technical control laboratory, Crown Williams Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington, was transferred to the central technical department of Crown Zellerbach Corporation the first of June.

Improve BRIGHTNESS

CHECK COLOR REVERSION
with



SO₂
BEAR
BRAND
Sulphur
Dioxide

Final bleaching stage is usually a hypochlorite bleach and the stock from this stage in best practice has a pH of 7 as it reaches the washer. If the pH is reduced to less than 7 removal of impurities in washing takes place more easily. It has become common practice especially when bleaching sulphate pulp to follow the last stage of bleaching by a double wash with an intermediate soak period of 20 to 30 minutes wherein the pH is adjusted to the acid side.



Sulphurous acid is preferred for this pH adjustment and it is formed by injecting SO₂ into the pulp suspension. This not only aids the removal of impurities in the final wash but in addition, the SO₂ acts as an antichlor. SO₂ also tends to reduce ferric iron to ferrous which is more easily washed out. Kraft pulps usually contain considerable ferric iron which if not removed or reduced may discolor the pulp during drying or subsequent storage.

GREAT WESTERN DIVISION • THE DOW CHEMICAL COMPANY
SAN FRANCISCO, CALIFORNIA

Seattle • Los Angeles

Longfibre Softball League Organized

• The Longfibre Softball League was organized among employees of Longview Fibre Company, Longview, Washington, early in May and play started the 12th of that month. There are seven teams in the organization, which are the office, box factory, bag plant, millwrights, pipe fitters, machine room and finishing room. The pipe fitters and bag plant teams were tied for first place the first of July, which was the end of the first half season, except for the play-off to decide the winner of the half season.

Three games weekly were played during the first part of the season. There will be seven games played per week during the next half of the season.

Pat Leedle, of the pipe fitters team, is president of the league; Wally Reiniger, of the office team, is treasurer and Bill Winn, of the bag plant team, is secretary of the league.

Government Printing Office Storing More Paper

• Since the beginning of the war the Government Printing Office has rented three large warehouses to store paper for emergency purposes.

The printing office itself has large storage space for paper which is sufficient for all peace time purposes. However, it is now apparently necessary to store so much paper that in addition to its own storage space the office has rented a large warehouse in Washington, another in Rosslyn, Maryland, and a third in Baltimore. It is said that the printing office has never had as much storage space for paper as it has at this time.

Camas Men Finish Golf Tournament

• The annual spring handicap golf tournament of Crown Willamette Golf Association, composed of employees of Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington, was started April 25th and completed June 25th, after many interruptions from inclement weather. According to Andy Anderson, wood technologist, who was chairman of the tournament, "the final matches were played in an extremely wet atmosphere. Technically, it was raining, but felt more like playing on a lake bottom with the lake still there."

Match play was on a handicap basis with a total of five flights. The winner of each flight was awarded a 26-ounce beer mug suitably inscribed and the winners of the runner-up prizes awarded 20-ounce beer mugs, also suitably inscribed. Each trophy contained \$2.50 in defense stamps. George W. Charters, assistant resident manager, made the presentations.

Winners are as follows:

First flight—George Johnson, machine tender on No. 6 paper machine; runner-up, Harold Tuttle, printing department.

Second flight—Andy Anderson, technical department; runner-up, O. T. Deffoux, steam plant superintendent.

Third flight—Walt Rains, bag machine adjuster; runner-up, Sprague Yeager, order department.

Fourth flight—Melvin Anderson, rigger; Sam Runyon, runner-up, converting plant shipping.

Fifth flight—Tom Martin, product quality supervision; runner-up, Fred Carey, machine tender No. 6 machine.

Dryer Canvas Used For Stretchers

• Discarded cotton dryer canvas from the paper mills is finding an important use in the making of stretchers for civilian defense work, according to Dr. J. L. Norris of Longview. Dr. Norris told a special war session of the American College of Surgeons in Portland last April that a number of communities had solved the shortage of stretchers by using dryer canvas.

Doctors from Salem, Oregon, reported that the canvas was also being used for emergency blankets.

Salem Down Week For Repairs

• The first complete shutdown of the Oregon Pulp & Paper Company's mill at Salem, Oregon, occurred over the Fourth. The mill stopped June 30th and operations were resumed July 6th.

During the shutdown repair crews were busy overhauling equipment. The office floor was lowered 30 inches to the level of the new warehouse. During the shutdown most of the employees took their week's vacation.

St. Helens Down Over Fourth

• St. Helens Pulp and Paper Company, St. Helens, Oregon, closed down on July 3rd, 4th and 5th, except for a maintenance crew which was off just on July 4th.

Bird Saveall At Pacific Paperboard

• A Bird saveall is being installed in the waste water line of Pacific Paperboard Company plant at Longview, Washington.

Plenty of Parchment Reports Paterson

• "So much conflicting information is appearing in the press concerning the paper situation, that we want you to have first-hand knowledge with regard to our products," says a letter from W. H. Enell, advertising manager of the Paterson Parchment Paper Co., Bristol, Pa.

"The use of Vegetable Parchment has NOT been restricted and ample stocks of the new "War Weights" (27-lb., 35-lb. and 45-lb.) are available for the protection of food products.

"Patapar Vegetable Parchment, with a special coating, has also been successful in replacing certain metal containers and other materials no longer available.

"Some suggestions have been published recently pointing out ways of saving Vegetable Parchment. These suggestions seem based on a situation existing months ago, when a general paper and paper board shortage appeared imminent. The facts now show, however, the past heavy demand was apparently caused by inventory buying, and not by 'new' consumption.

"Flavor and food values must be preserved in war time for the armed services, lend lease or civilians. Unless some unforeseen change occurs in the supply of raw materials, there is no need to take chances in the protection of food products by scrimping on Vegetable Parchment in food packaging."

Paterson has recently issued a folder entitled, "Look at these jobs Patapar will do for you." Emphasized are the characteristics, strong when wet and when boiled; resistant to grease and oils. Suggested uses are for: butter wrappers, tub liners and circles, milk bottle hoods, milk can gaskets, ice cream wrappers, flavor labels, cheese wrappers, and as a seal for clean out parts on such machines as milk coolers.

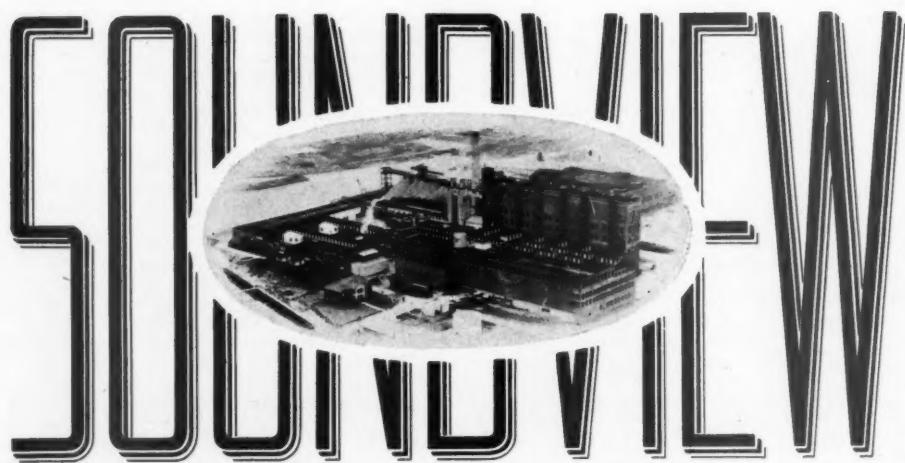


WEST LINN GOES "OVER THE TOP" in War Bond Drive . . . Crown Willamette Paper Co., Division of Crown Zellerbach Corp., West Linn, Oregon, attained 100% employee purchasing of bonds on June 27th and on July 6th the buying reached 10% of the total payroll.

A display board, erected at the mill entrance showed the per cent deductions for each department and also the percentage of employees of the department subscribing. The board will be kept up for the duration.

When the West Linn drive went over 90% participation a U. S. Treasury Certificate and "Minute Man" flag was awarded. Left to right in the flag awarding ceremony, TOM SMITH, President, Clackamas County Central Labor Council, who was in charge of the bond selling campaign; WM. ANDERSON, Financial Secretary, Local 166, International Brotherhood of Paper Makers; CLARENCE ENGHOUSE, Assistant to the Resident Manager; CLARENCE E. BRUNER, Resident Manager; J. R. GUYNES, Chairman, Payroll Allotment

*Annual Capacity
Approximately 175,000 Tons*



High Grade
**BLEACHED
SULPHITE PULP**

SOUNDVIEW PULP COMPANY
EVERETT • WASHINGTON



Paper Makers Hold June Meeting

Hear two speakers, C. L. Clark of Nash Engineering Company on "The Application of Vacuum Equipment for Water Removal on Paper Machines"; and A. J. Smith, Purchasing Agent, Fibreboard Products Inc., Vernon Division, on "The State of Industry."

The Paper Makers and Associates of Southern California held its dinner meeting at Carl's View Park Cafe on June 18th. The late U. Grant Farmer, the new chairman, presided.

The two speakers of the evening were introduced by program committee chairman, W. A. Kinney.

First to speak was C. L. Clark of the Pulp and Paper Division of the Nash Engineering Company, who gave a paper on "The Application of Vacuum Equipment for Water Removal on Paper Machines" which created great interest among those in attendance as shown by the lengthy discussion which followed.

A. J. Smith, purchasing agent of the Vernon Division of Fibreboard Products Inc., gave the second talk on "The State of Industry," when viewed in the light of recent information obtained from his attendance at the recent New York meeting of the National Association of Purchasing Agents and from his visit to Washington.

A resolution was passed by the association giving its support to an educational program, a course in Pulp and Paper Technology, to be held at the University of Southern California under the auspices of the United States Office of Education.

The following men attended the June 18th Dinner Meeting:

- Taylor Alexander, California-Oregon Paper Mills; Paul A. Armstrong, K. H. Bears, Philadelphia Quartz Co.; R. A. Baum, Fernstrom Paper Mills; J. D. Beatty, Volney Felt Mills; W. Bellman, Pioneer Division, The Flintkote Co.; W. C. Birdsey, Pioneer Division, The Flintkote Co.; G. H. Boeck, Oakite Products; B. F. Brown Jr., Fibreboard Products Inc.

- H. D. Brown, El Rey Products; C. L. Clark, Nash Engineering Co.; R. L. Culp, Pioneer Division, The Flintkote Co.; F. E. Dilley, Pioneer Division, The Flintkote Co.; G. E. Eberhard, Fibreboard Products Inc.; J. S. Earhart, J. S. Earhart Co.; Frank Eggert, California Oregon Paper Mills; Oscar Eilersgaard, Pioneer Division, The Flintkote Co.

- U. G. Farmer, Fibreboard Products Inc.; John Fogal; W. P. Foote, The Bristol Company; G. Ford, Fibreboard Products Inc.; J. W. Genuit, Fernstrom Paper Mills; W. D. Gahring, U. S. Gypsum Co.; A. L. Gossman, The Dicalite Company; J. E. Hartford, U. S. Gypsum Co.; A. H. Hatch, California Oregon Paper Mills.

- H. L. Joachim; W. H. King, Pioneer Division, The Flintkote Co.; Ed Kendall, English & Lauer, Inc.; W. A. Kinney, Pioneer Division, The Flintkote Co.; F. L. Mark, U. S. Gypsum Co.; P. F. Math, California Ink Co.; W. R. Monette, The Dicalite Co.; E. J. Nugent, California Container Corp.; G. A. Phillips, Pioneer Division, The Flintkote Co.; R. D. Pomeroy, University of California at Los Angeles.

Charles Remine, California Oregon Paper Mills; A. Schwartz, California Ink Co.; Carl Selander, Stauffer Chemical Co.; A. Shade, Fibreboard Products Inc.; A. J. Smith, Fibreboard Products Inc.; J. H. Smith; A. M. Turner, Schumacher Wallboard Corp.; J. Van Ounsem, Pioneer Division, The Flintkote Company; H. A. Vernet, A. E. Staley Mfg. Co.

F. H. Wheelock, Fibreboard Products Inc.; H. B. Will, Pioneer Division, The Flintkote Co.; W. C. Zeitz, Fernstrom Paper Mills.

Weyerhaeuser Men Join Armed Forces

- B. N. Nelson, of the instrument department, Longview Mill, Pulp Division Weyerhaeuser Timber Company, Longview, Washington, became a member of the Coast Guard during the latter part of June, with a rating of chief petty officer.

Hugh Hinkleman, also of the Pulp Division of Weyerhaeuser Timber Company at Longview, left for service with the navy on July 8th. He is rated a second class petty officer and anticipates becoming an aerial photographer.

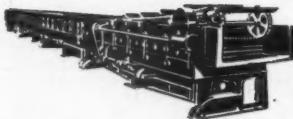
St. Helens Increases Size of Salvage Shop

- St. Helens Pulp and Paper Company, St. Helens, Oregon, has recently doubled the size of the plant's salvage shop by building on an addition. This building is now 30 by 80 feet. The addition increases the working space for repairing used parts and allows for greater storage facilities.



PAPER MAKERS & ASSOCIATES OF SOUTHERN CALIFORNIA meet in Los Angeles on June 18th . . . U. GRANT FARMER, who died suddenly July 1st, (arrow) presided as the newly elected Chairman of the group.

Take Care OF YOUR EQUIPMENT and it will take Care of You!



FLAT SCREENS

Use only the greases specified or the equivalent; do not over or under grease.

Do not use an "as good" grease unless its qualities are equal. Never use the rocker-shaft bearing grease in anti-friction bearings.

Where screens are equipped with Keystone fittings for gauging amount of grease, be sure screen is stopped before greasing. If shaft heats, check that grease seals are saturated with oil.

Do not attempt to cool a hot anti-friction bearing by using oil. Instead, clean out old grease, wash with "sluicing oil" and repack. Do not use kerosene.

Never oil rubber torsion bushings. Never replace one at a time but change both of a pair to insure even distribution of load.

From time to time, all bolts in screens should be tightened. Check also that the end collars on the rocker shafts are tight against bearing housings.

Do not change stroke or speed of screen without consulting the manufacturer.

Prevent wrinkling by putting wires on as tight as possible.

Keep cough and press rolls in alignment; keep press rolls away from wires by proper adjustment.

Avoid walking on cylinder moulds.

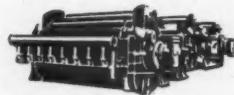
Do not adjust doctors to bear too tightly; prevent unnecessary wear and scoring.

Check to be sure that cylinder cleaning showers have ample pressure to keep wires clean.

Keep open flame from rubber and do not expose to too high temperatures.

Thoroughly clean and wash machine when shutting down to prevent caking up of stock or sludge.

On mechanical variable speed transmissions, grease frequently, clean out excess grease, and run them through full range once per week.



WASHERS and THICKENERS

Vacuum and Open Cylinder Type

Maintain all packing glands in good condition; do not over-tighten and be sure that packing is not scoring.

Be sure sealing water is on where required before starting equipment, especially on rubber covered machines.

MAKERS OF
THE FOLLOWING MACHINES
FOR THE PAPER INDUSTRY
ROTARY AND FLAT SCREEN KNOTTERS • FLAT SCREENS •
CENTRIFUGAL SCREENS • METAL OR CYPRESS
WITH DUNBAR DRIVE • VACUUM FILTERS, INCLUDING SAV-
EALLS, WASHERS, HIGH DENSITY THICKENERS •
LIME SLUDGE FILTERS • BLACK LIQUOR
WASHERS • FORMING CYLINDERS • MULTIPLE
STAGE COUNTER-CURRENT PAPER STOCK
WASHERS • DECKERS • WET MACHINES •
INCLUDING HYDRAULIC WITH HIGH DENSITY
VACUUM WET END • THORNE BLEACHING
EQUIPMENT • PNEUMATIC WATER FILTERS
• THE IMPCO LINE •
OF "IMPROVED" EQUIPMENT IS ASSISTING
IN THE ECONOMICAL PRODUCTION OF
QUALITY PULP AND PAPERS

IMPROVED PAPER MACHINERY CORPORATION

NASHUA • NEW HAMPSHIRE

British Columbia Logs Cause Dispute

A storm developed in British Columbia during May over pulpwood export policy as a result of the Timber Controller's action in raising prices and granting special permits for shipments of hemlock to the United States over the head of the log export committee which in the past has exercised complete control over the situation.

The situation reached a peak early in May when Hon. A. Wells Gray, provincial minister of lands, who customarily has the last word in issuance of export permits for logs, declared that his hands had been tied by the Ottawa government through the timber controller as a result of pressure brought to bear by the United States on the Canadian administration.

This drew from D. D. Rosenberry, assistant timber controller with headquarters in Vancouver, a denial that the Timber Control was attempting to dictate export policy to the provincial government and the log export committee.

On the sidelines, although directly interested and affected by whatever change in policy may be made, are British Columbia pulp and paper companies whose reserves of logs have been severely curtailed in recent weeks, partly, it is claimed, because of the heavy export of logs to the United States.

At one time during the past month Powell River Company, largest newsprint producer on the Pacific Coast and the biggest single factor in the British Columbia industry, had a reserve supply for only ten days, contrasted with the usual reserve of thirty days. British Columbia Pulp & Paper Company, with mills at Woodfibre and Port Alice, customarily has about 30,000,000 feet of cull spruce, hemlock and balsam in reserve, but stocks were down to about 5,000,000 feet. Pacific Mills, Ltd., subsidiary of Crown Zellerbach Corporation, is not so seriously affected because it has large timber holdings of its own and recently augmented them with the purchase of additional hemlock in the Nimpkish River country from the Cargill interests.

Although the pulp and paper interests of British Columbia objected to the recent increase in the price of hemlock logs from \$12 to \$15 per thousand board feet, claiming that this was an unnecessary impost at a time when all other costs of manufacturer were increasing without compensating increase in the price of the finished product, Mr. Gray, the minister of lands, did not enter the picture on the side of the pulp and paper men until the Timber Controller's office overrode the authority of the log export committee and ruled that a boom of some 10,000,000 feet of hemlock from Port Alberni on the west coast of Vancouver Island should be exported to the United States.

These logs were part of a consignment cut originally for Japanese buyers and when all exports to Japan were declared illegal last winter the boom was left in the water at Port Alberni. Application to export the logs went before the export committee of which chief forester C. D. Orchard is chairman, with Fred B. Brown, George O'Brien, Dewey Anderson and Robert McKee representing the loggers, and C. D. Culter, A. L. Hughes, Robert McDonald and Bruce Pendleton representing the sawmills and shingle mills. The committee turned down the application on the ground that there was a market for the logs in British Columbia.

Assistant Timber Controller Rosenberry recommended, however, that the logs be moved to the United States and in justification for this step he told PACIFIC PULP AND PAPER INDUSTRY that the logs had been in the water four months and were in danger of serious deterioration from teredo action; that the B. C. paper companies had shown interest in the logs only when there appeared to be some chance of their being shipped out of the country. On the other hand, representatives of the paper companies in British Columbia say they did not know about the existence of the logs until the move to have them exported was already under way.

In a front page news story from its correspondent in Ottawa, The Vancouver Sun stated that "the two governments (Canada and the United States) are under almost irresistible pressure to allow British Columbia hemlock logs to be exported in virtually unlimited quantities to the United States for pulp milling there."

Commenting on this, Mr. Gray, who obviously does not relish the lost authority over log exports, said: "I wouldn't exactly say that Puget Sound is demanding the exports of the logs, as The Sun says. I think the demand was from Washington to Ottawa.

"Cooperation between Canada and the United States is necessary at this time, but I don't see why we should have to shut down Powell River because they can't get logs there."

Mr. Gray said that early in April he wrote to Mr. Rosenberry advising him he was unable to approve export in this case of hemlock logs from the Alberni Canal.

"I am satisfied the logs are required to maintain mill operations," Mr. Gray's letter to the assistant timber controller said. "I am in full sympathy with any effort for international cooperation in the interests of war production, regardless of established provincial policy, but I am unable to see what immediate or future advantage could accrue from restricting the out put of one mill in order to maintain that of another."

To this Mr. Rosenberry replies that his action governed only this isolated case and that there is no new general policy towards log exports.

"So far as I know," he said, "hemlock and balsam logs will continue to be governed by the log export committee unless the timber is from Crown grant land, in which event logs may be exported without special license. We are prepared to let the log export committee continue to run the show, but the timber control reserves the authority under the War Measures Act to take steps when deemed necessary to control the situation."

Hemlock and balsam exports to the United States have increased rapidly in recent years. In 1935 the total exported was only about 34 million board feet, but the amount had risen to 75 million feet by 1937 and in 1939 the total was 123 million feet. In 1940 the total was 141 million feet and last year the all-time high of 195 million feet was attained.

Some authorities, particularly the loggers, contend that the whole problem is not tied up in export policy but in wartime labor shortage. There has been a pronounced drift of manpower from British Columbia spruce and hemlock camps to the shipyards and war industries, and

replacements have been inadequate and inefficient. In addition, weather conditions earlier in the year were unfavorable for a large output of logs.

Those who look at the longer term, however, contend that sooner or later British Columbia must tackle in more realistic fashion the fundamental facts that lie behind extensive log exports. They point out that the forest industries are British Columbia's most important revenue producers, yielding \$129 millions last year compared to second-place mining's \$75 million. They declare that the Douglas fir era on which the sawmill industry has gained most of its prosperity is now already on the wane; that the next great era for British Columbia timber will be that in which hemlock becomes the dominant commercial species.

"How can British Columbia realize the wealth of this hemlock age if she permits her timber to be exported without reservation?" ask the long-term theorists, who fear that wartime exigencies may undo many of the things done in the interest of conservation in the past. These planners had hoped that hemlock would fill in as the major crop during the hiatus between the decline of first growth Douglas fir and the commercial exploitation of young growth and the more inaccessible forest areas.

Some of these authorities argue that the pulp industry of Puget Sound has overbuilt its plants and needs more pulp wood than it can get from the United States; that British Columbia is being penalized for Washington's over-expansion.

But judging from the policy of the timber controller so far, the present program will be guided by war requirements and the needs of the hour rather than by forecasts of tomorrow. Washington pulp mill operators argue effectively that they are in many cases manufacturing on a lend-lease basis for Britain and that they could not be restricted from obtaining raw materials where necessary from British Columbia.

There is a feeling that, regardless of its temporary effects on British Columbia's pulp and paper industry, there will be more generous cooperation between the Canadian and the United States governments in the matter of log export.

Indeed, one of the expected results of the recently authorized higher price for hemlock logs in British Columbia was creation of additional incentive for logging the species so that a greater surplus might be developed for export to the United States.

By way of explanation, the provincial government has no control over exports from Crown lands—the lands within federal jurisdiction, but exports from provincial leased timber are controlled by the log export committee headed by the provincial chief forester and a panel of loggers and sawmill men, whose names I give you.

However, in an emergency the timber controller, who represents the federal government, has power under war legislation to step in during an emergency and do pretty well as he pleases. He can still override the provincial log export committee if he considers that an emergency exists. And that is what he did in connection with the Port Alberni boom that caused all the fuss a while ago. However, the general policy is to leave these exports from non-Crown lands in provincial hands.

Hawley Riveted Seam Holds Until Dryer Felt Wears Out

General Superintendent Austin Nickels describes insulated riveted seam which ran 192 days.

● The operating life of dryer canvas is one of the important factors determining frequency of shutdowns. Seams have been found to be the weak point of dryer canvas; at least that is the part which is apt to show initial weakness and ultimately fails, resulting in a shutdown of the machine.

Different machines in various mills have been found to respond differently to the various types of seams. Where the sewed seam is most satisfactorily used on one machine a glued seam may be found best on another and a riveted type on another machine. Austin Nickels, general superintendent, Hawley Pulp and Paper Company, Oregon City, Oregon, uses a riveted seam with backing on each side of the canvas, which, he says, allows the dryer canvas to be used until it is "absolutely gone."

These are open-backed seams with the canvas overlapping about seven or eight inches. The overlap gives two thicknesses of canvas through which the rivets pass. In addition a strip of asbestos listing about three-quarters inch wide is placed along each row of rivets, on the side of the canvas next to the dryers. The rivets go through the asbestos listing, through both thicknesses of can-

vas and then through another backing, which is a one-inch strip of cotton webbing.

The asbestos insulates the dryer canvas from the excessive heat of the dryers, thereby maintaining a strength factor which might otherwise be lost. The cotton webbing is a tough fabric with two-way diagonal weave and acts as a foundation upon which the spurs of the rivets are clinched.

Mr. Nickels reports that this type of seam permits considerable longer use of the dryer canvas than he has been able to get by any other means. The first of July he removed a cotton dryer canvas which had run a total of 192 days.

George Wolfe Vacationing In Minnesota

● George Wolfe, master mechanic, Longview Mill, Pulp Division Weyerhaeuser Timber Company, Longview, Washington, left with Mrs. Wolfe for a two-week vacation on July 10th. They intend spending most of the time at Montevideo, Minnesota, Mr. Wolfe's former home. They are to return home by way of Salt Lake City and Los Angeles.

Layton Commissioned Lieutenant In Navy

● A. B. Layton, a vice-president of the Crown Zellerbach Corporation, has received a commission as lieutenant senior grade in the Navy.

Booklet on War Gases Issued by Penn Salt

● "Warfare gases merit your respect; but your fear is unjustified." This is the opinion of a man whose entire professional life for the past 17 years has been spent in public health work and in chemical safety promotion.

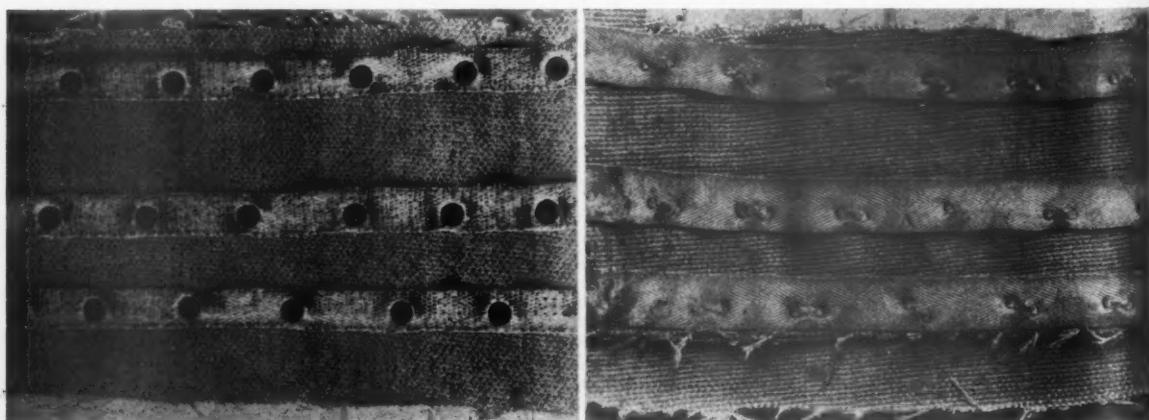
L. L. Hedgepeth, manager of technical service for the Pennsylvania Salt Manufacturing Company, chemicals, is the author of the above statement in a study entitled "Warfare Chemical Hazards." It is a reprint of an informal lecture given by the author before air raid wardens in Delaware County, Pa.

Mr. Hedgepeth discusses gas warfare from the standpoint of civilian defense protective measures. The effects of gas are discussed and the article also names the principal war gases, describes their characteristics and suggests first aid treatment for victims. The study voices a note of reassurance, giving the civilian a calm, non-technical understanding of what actually is involved in gas warfare.

The study appears as a supplement of "The Laundry Bundle" published by the company for May, 1942. A limited supply of reprints is available for interested persons from the Pennsylvania Salt Manufacturing Co. of Washington, Tacoma, Wash.

Campbell Joins C-Z Public Relations

● J. D. "Scotchy" Campbell, formerly with the Western Waxed Paper Company, Oakland, is now an assistant in the industrial relations department of the Crown Zellerbach Corporation.



The HAWLEY RIVETED DRYER FELT SEAM . . . as described in the accompanying article by AUSTIN NICKELS, General Superintendent.

The photographs show both sides of the seam which recently held a cotton dryer canvas for 192 days, the canvas wearing out before the seam . . . Strips of $\frac{3}{4}$ -inch asbestos listing tape are placed under the rivet heads, protecting the canvas from excessive dryer heat.

On the reverse side strips of 1-inch two-way diagonal weave cotton webbing run the full length of the splice . . . Rivet spurs pass through the webbing and are clinched, the webbing giving a firm foundation for the splice.

Production to Capacity Ratio Declines

• In the last month the American Paper & Pulp Association's production to capacity ratio has dropped rapidly, from 94 per cent of paper capacity during the week ending May 23rd to 84.9 per cent for the week ending June 27th.

The average for June was 87.2 per cent and for May 95.5 per cent. January was the high month with 104.5 per cent. February declined to 103.4 per cent, March to 102.7 per cent and April to 100.3 per cent.

As the Association has pointed out, production has exceeded orders since October, 1941. It is expected to strike a balance in the 80 per cents, but the declining production of civilian goods may carry the demand still further down the percentage scale.

June operations with 87.2 per cent of capacity, compares with January, 1941, with 85.6 per cent, and February, 1941, with 89.7 per cent. Production was on the upgrade then with mounting war orders being superimposed upon a booming civilian economy. Besides the fear of shortages was growing and buyers were stocking up.

These inventories in the hands of consumers and jobbers are now exerting a bearish influence on production. Some believe the inventories will exert pressure throughout 1942 or even longer.

Another depressing factor has been the drive to economize on paper and paperboard. The idea that it was patriotic to use less paper and board spread rapidly and, as one company has pointed out, has attained a point dangerous to public health. The reduction in the use of board for shipping containers has resulted in great damage to the products being

shipped, it is reported. This results in a net loss to the country rather than a saving.

The National Paperboard Association reports that in the weeks ending June 6th and June 20th the production was at 69 per cent, while for the week ending June 27th it rose to 72 per cent. The average for June was 70.5 per cent, compared with 82 for May, 93 for April, 101 for March and February and 102 for January. Part of this drop was seasonal but the greater portion is believed to be due to the stoppage of production of civilian goods consuming large quantities of paperboard, i.e., autos, refrigerators, radios. Also lighter weight shipping containers, aimed to save materials, account for some of the decline.

Pulp Producers Issue Wood Pulp Book for 1942

• The 1942 edition of "Wood Pulp Statistics," which contains official ten-year data on United States and Canadian production, consumption, imports and exports of wood pulp, has just been issued by the United States Pulp Producers Association.

Included are similar figures, as available prior to September, 1939, for all countries producing or importing wood pulp. Market price tables on the various grades of pulp are given.

The table of contents reads: United States Wood Pulp Data, Paper Data, Pulpwood Data; Canadian Wood Pulp Data, Pulpwood Data; World Wood Pulp Data; United States Rayon Data; and World Rayon Data.

Copies of this 96-page book may be obtained from the United States Pulp Producers Association, 122 East 42nd St., New York City at \$2 each.

Clark Lewis, Captain Quartermaster Corps

• Clark Lewis, until recently in charge of traffic and shipping, Longview Mill, Pulp Division Weyerhaeuser Timber Company, Longview, Washington, is again in the United States Army, as a captain of the quartermaster's corps. Early in July he was stationed at Seattle.

During the First World War Mr. Lewis was a member of the army of occupation, in the quartermaster's corps. Following the war he engaged in ROTC instruction until 1923 when he was mustered out of the service with the rank of captain.

He later became a member of the construction crew building the Longview Mill, Pulp Division of Weyerhaeuser Timber Company. When the mill started operations in 1931 Lewis became head of the traffic and shipping, where he has continued until his recent rejoining the army.

Longfibre Down Thirty-two Hours

• Longview Fibre Company, Longview, Washington, observed a thirty-two-hour shutdown the weekend of July 4th. The maintenance work carried on at that time was of a nature that it could not have been conveniently done at any other time.

Jimmy Anderson Ill At Home

• Jimmy Anderson, assistant paper mill foreman, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, West Linn, Oregon, was taken ill the first of June and was still confined to his home the early part of July.



Weyerhaeuser Longview Mill 100% Bond Buyers. An intensive drive was instituted by employees of Longview Mill, Pulp Division Weyerhaeuser Timber Company, Longview Washington, on June 10th, under the supervision of a committee appointed by Local 153 of International Brotherhood of Pulp Sulphite and Paper Mill Workers. This was a drive for the regular purchase of War Bonds by one hundred per cent of the employees.

One week after the drive was started the goal was attained, with all of the employees buying War Bonds regularly by the payroll deduction method. At the time the drive got under way but 48 per cent of the employees were signed up for regular purchase of the bonds.

Members of the committee shown in the accompanying picture are L. G. Thomas, machine tender; Ed Bollon, filter operator; Don Bornstedt; Stan Brown; Roy Hunton, welder; Millard Lamb; Ivan Miller, screen tender; Henry Handley, assistant bleacherman; and Ken Larkin timekeeper. Other members of the committee, not shown in the photograph, are Don Baker, of the chipper plant; John Handley, millwright; and Mrs. Agatha Rizor, of the office. (Photograph by Ed Dahlquist of the Weyerhaeuser laboratory, Longview.)

Improving No. 2 At Pacific Paperboard

● Number two machine of Pacific Paperboard Company, Longview, Washington, is being modernized by replacing five belt couch rolls with rubber couch rolls. Cylinder mold bearings of this machine are being replaced with Shafer anti-friction pillow blocks.

Soundview Holds Annual Picnic

● The Soundview Pulp Company's Annual Picnic was held July 4th at Lundein's Park with a very large crowd in attendance.

Starting off at 10:30 a.m. with a softball game between the Slave Drivers and Pen Pushers versus the Slaves, and a tug of war between twelve man teams from the pulp mill and sawmill, the party lasted through the evening.

The afternoon was given over to children's sports, races for boys and girls and water events for the good swimmers. All prizes were defense stamps. In the evening a big dance closed the day's festivities.

Soundview Down For a Week

● The Fourth of July holiday gave the Soundview Pulp Company at Everett an opportunity to shutdown for repairs and alterations planned for some time. The mill went down on July 3rd for a week, with all mill employees except the repair crews taking their vacations.

Ward Resigns From Camas Control Lab

● Charles B. Ward, chemist in the control laboratory, Crown Willamette Paper Company, Division of Crown Zellerbach Corp., Camas, resigned the first of July. With Mrs. Ward he left for Lafayette, Indiana, where they will make their new home.

The Camas technical department held a farewell party for Mr. and Mrs. Ward.

Hobart Race Father Of Baby Boy

● The report is a bit late but the importance of the arrival of young Allen Race on April 18th at the home of Mr. and Mr. Hobart Race, justifies its recording.

Mr. Race, who is machine tender for the Puget Sound Pulp & Timber Company at Bellingham, now has three children, two daughters and a son.

J. J. Ross Offer Handy Scoop Truck

● The Climax wheeled scoop truck for easy handling of bulk lime, sulphur, sand gravel, etc., is being offered for sale by the J. J. Ross Mill Furnishing Co. of Seattle and Portland.

The scoop, which weighs 75 pounds, will hold from three to four cubic feet of material.

J. J. Ross also manufacture perforated metal plates in a variety of metals and sizes of perforations, and sell wire cloth screen for grading purposes.

J. E. Whiting Now At Millwood

● J. E. Whiting of the Los Angeles office of the Inland Empire Paper Company, Millwood, Washington, was transferred to the mill on May 1st, according to an announcement by S. R. Whiting, Pacific Coast sales manager.

Wall Vacations At Deer Lake

● Harold C. Wall, chief chemist, Longview Fibre Company, Longview, Washington, returned from a two-week vacation on July 6th, which had been spent with his family at Deer Lake near Spokane.

Lab Staff Enjoys Mullett's Cigars

● The laboratory staff of the British Columbia Pulp & Paper Company at Port Alice, B. C., enjoyed free cigars the last of April when Lorne Mullett announced the birth of a baby boy on April 25th. The father is now fully recovered, his colleagues report.

Weyerhaeuser Reports Increase in 1941 Net Income

● The latter part of May the Weyerhaeuser Timber Company, Tacoma, reported a net income of \$8,613,529, or \$2.87 each on 3,000,000 capital shares, against \$8,248,795, or \$2.75 a share in 1940.

The report does not segregate net income from pulp and timber operations.

Witt Leaves For Alaska

● Charles Witt, Jr., of the technical control laboratory, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington, resigned the first of June to accept a construction job in Alaska.

Varney Vacations By Working

● Preston B. Varney, shift foreman, Longview Mill, Pulp Division Weyerhaeuser Timber Company, Longview, Washington, took a one-week vacation starting the last of June and returning to work on July 6th. He spent the week at home working on his Longview ranch.

Bob Wertheimer Takes Vacation

● R. S. Wertheimer, vice president and resident manager, Longview Fibre Company, Longview, Washington, took his vacation during June. He and Mrs. Wertheimer spent most of the vacation at Sun Valley, Idaho.

Andy Olson Vacations In Minnesota

● A. W. Olson, in charge of orders and shipping, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington, returned on July 2nd from a two weeks' vacation to Minnesota.

Hawley Bond Buying Now 13% of Payroll

Time cards, stamped with red, white and blue bullseye, indicate 10% purchasers.

● The drive to complete the quota of United States War Bond and stamp sales established for the month of July by Secretary of Treasury Morgenthau was more than met by Hawley Pulp and Paper Company on July 6th, when Carl E. Braun, vice president and mill manager, announced that over 13 per cent of the company's payroll was pledged for the regular purchase of the bonds. One-hundred per cent of the employees had already signed up for the regular purchase of bonds by payroll deductions, but only about 50 per cent of the employees were buying them to the full extent of the ten per cent asked, at the end of June. On the first day of July the ten-per cent drive officially got under way and all of the employees pledging purchases of bonds to that extent were presented with lapel cards which were printed in red, white and blue on both sides, saying "I have contributed * * * War Bonds * * * Have You?" and have 10% printed in a bullseye.

Mr. Braun conceived an effective idea supplementing the lapel cards. The bullseye and ten-per cent figure were printed on the time card of each man who pledged that amount of his pay for the purchase of war bonds. He reports that the purchases were immediately accelerated. The

idea was so successful that Allan Rinehart, deputy administrator, Treasury Department, War Savings Staff, asked Mr. Braun for 50 sample cards with the bullseye stamp on them.

In a letter Mr. Rinehart congratulated Mr. Braun on his "exceptional record."

The drive was headed by an organization consisting of the foremen of the various departments, the standing union committee and the shop stewards' committee.

When an employee contributes to the United Service Organization it is immediately recognized and the letters "USO" are stamped on his time card in red letters.

According to Mr. Braun, "Everybody is contributing to the regular purchase of war bonds, from the president of the company right down the line to the newest worker in the plant."

Crown Zellerbach Declares Regular Dividend

● The directors of Crown Zellerbach Corporation declared on June 26th the regular quarterly dividend of \$1.25 per share on the \$5 cumulative preferred stock, payable September 1st to stock of record August 13th.

Trade-Talk



of Those Who Sell Paper in the Western States

Holland Elected Director Zellerbach Paper Co.

• Philo K. Holland, manager of the Los Angeles Division of the Zellerbach Paper Company, has been elected a member of the board of directors of the firm.

Ben Levison Dies In San Francisco

• Ben Levison, who for the past 20 years has represented various paper manufacturers in San Francisco as Coast representative, died June 3.

He left a wife and one son. Mr. Levison, at one time was an employee of the Zellerbach Paper Company.

Pusey Becomes Assistant to Hecht

• Robert Pusey, formerly of the sales department of the Fresno, Seattle, and San Francisco divisions of the Zellerbach Paper Company, has been appointed assistant to V. E. Hecht, vice-president and printing paper sales promotion department manager, in the printing paper merchandising department, headquarters division, succeeding the late E. J. "Ed" Tracy.

William Zellerbach Ensign In the Navy

• William Zellerbach, son of H. L. Zellerbach, president of the Zellerbach Paper Company, has, following his graduation from the University of Pennsylvania, been commissioned an ensign in the Navy.

Budge Passing Cigars—A Daughter

• E. D. Budge, assistant manager of the general merchandising department, headquarters division, Zellerbach Paper Company, was passing around the cigars recently. The occasion being the birth of a daughter to Mrs. Budge.

Chapin Hunts Have a Son

• Chapin Hunt, in charge of Lily Tulip sales for the Zellerbach Paper Company, San Francisco, and Mrs. Hunt are receiving congratulations on the birth of a son. It's their first child.

Marcus Alter's Daughter Married In San Francisco

• Miss Renee Alter, daughter of Marcus Alter, president of the Commercial Paper Co., San Francisco, was married June 20 to Erwin Dellman, USN. Mr. Dellman, a San Francisco boy, is connected with the Navy's physical fitness program.

Colton Back From P. A. Meeting

• L. A. Colton, vice-president of the Zellerbach Paper Company, is back at his desk following a month's trip which took him to New York for the twenty-seventh annual convention of the National Purchasing Agents Association. Mr. Colton also made calls in Los Angeles, Kansas City, Chicago, Indianapolis, Washington, Boston, Springfield, Mass.; Seattle and Portland, en route.

William Hokanson, purchasing agent of the Los Angeles division of the company, attended the same convention.

Prager Named Oakland Stationery Manager

• Richard "Dick" Prager has been appointed manager of the new stationery department in the Oakland Division of the Zellerbach Paper Company. Prager was formerly in the headquarters resale department.

C-Z Salesmen Receive Service Pins

• G. J. Ticoulat, sales manager, Crown Willamette Paper Company Division, Crown Zellerbach Corporation; E. D. Owens, assistant to the sales manager; and Henry Hassell, sales department; all were presented with service pins by Louis Bloch, chairman of the board.

Mr. Ticoulat got a 25-year pin, Mr. Owens a 20-year pin, and Mr. Hassell got a 10-year pin.

Victor Hecht Discusses Black Outs

• V. E. Hecht, vice-president of the Zellerbach Paper Company, San Francisco, recently addressed the seventeenth annual conference of the Pacific Society of Printing House Craftsmen at Riverside.

Mr. Hecht's topic was: "Black Outs—Yes and No."

Millard Rawlings Visits Camas

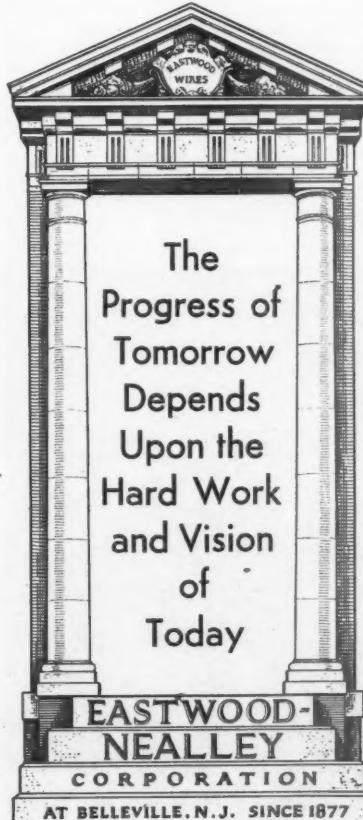
• Millard K. Rawlings, former registrar of the Crown Willamette Paper School, was a visitor at Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington, on July 2nd. He is now of the sales department in the San Francisco, California, offices.

Converters May Not Add Increased Freight Costs

• Manufacturers of industrial paper and converted paper products may not add increased freight costs to their maximum prices which were established in some cases by maximum price regulation No. 129 and in others by the General Maximum Price Regulation, OPA announced June 24th.

Under this interpretation, announced to clarify the problems of freight costs which have arisen since the issuance of the GMPR manufacturers who allowed partial freight must absorb the 6 per cent increase in freight rates, effected in March, 1942, and any other increase in freight costs incurred as the result of wartime emergency conditions such as the rerouting of shipments by rail instead of water.

Products covered are: waxed paper, envelopes, paper cups, paper containers and liquid tight containers, sanitary closures and milk bottle caps, drinking straws, certain tissue papers, rope and jute papers, technical papers, gummed papers, tags, pin tickets and marking machine tickets, glazed and fancy papers, standard grocers and variety bags, resale book matches, unprinted single weight crepe paper in folds, certain bag papers, certain wrapping papers, certain sulphite papers.



The Pacific Coast Analyzes Its War Job

by J. D. ZELLERBACH*

THE peaceful Pacific is no more. Today its bright clear waters resound with the roar of guns.

Bombs blast, torpedoes crash and lurking mines hide beneath its graceful swells.

For over four hundred years, in the knowledge of modern man, its waters and its shores have reflected an aura of friendliness, of kindness, of the peace which brought its name.

There have been little disputes; puny wars, lilliputian tempests, barely ruffling the surface of such great space.

The first World War barely touched our Pacific. Not so today—not so in this mightiest of all conflicts. Today from shore to shore, in every mile of its vastness from Alaska to Cape Horn, on every atoll, war in all its fury has burst forth. No longer do we Pacific people live wholly on the other side of the world from destruction—Today every one of us is a part of it—destroying and being destroyed.

This is not a war we know only through headlines. This is not a war we can shrug off as being the other fellow's job. This is our war.

Let us not be deluded. This is a war to control the oceans of the world—our ocean—the Pacific Ocean. The Pacific war is in our front yard.

Not so many years ago some of our forefathers drove across the plains in Calistoga wagons to pioneer on the Pacific. Others came around the Horn. All these and their children have found the richest blessings.

At first there was gold in the Sierras. Then there was fruit and grain in the valleys. Tall timber lured strong men to the forests. From this simple beginning we Pacific people have moved ahead farther in a short span of years than any group on the face of the globe.

It is only a few short years ago, as we look back, that nearly every necessity or luxury of life had to travel here from industrial centers far removed. Then we began to put our blessings to work. Our lumber products began to build and furnish the homes of millions throughout the world. Water was brought to our fertile soil and agriculture boomed until food products of the Pacific were the most sought after in every market place.

At the end of the last century a venturesome group of men drilled wildcat well and a new Pacific industry was born whose fabulous legends have made the names of Signal Hill and Kettleman world famous.

Memories Thing of the Past

• But the nostalgia of memories ceases today before the stark realism of the fight for survival. No longer are we a land of peace and plenty. No longer a glamour center of the world. We are at war. We play a most important part in this great nation in winning this war.

*Regional Vice President National Association of Manufacturers. Presented at the N. A. M. dinner held in Seattle the latter part of May, 1942. Mr. Zellerbach is President of the Crown Zellerbach Corporation, Executive Vice President Rayonier Incorporated and Chairman of the Board of Fibreboard Products Inc.

Our bombers—yours and mine—built by the muscle of men of the Pacific—these bomb Tokyo! These and thousands of others will bomb and bomb our enemies until they cry for peace—for the perpetual peace which we desire so fervently.

Let us take stock. Let's see what we are doing today. First, let's recognize that 20 per cent of America's armament expenditures are being made in the three Pacific Coast states; 20 against 10 per cent of the nation's population. This is the greatest compliment ever paid to a group of American people. We on the Pacific are requested to build twice as much per capita as has been requested of any other group. We can build it, and we are building it. Our shipyards are setting records. Our plane factories are producing in fantastic quotas hardly dared to be expected a year ago. Honors have been heaped on Pacific Coast factories in recognition of their excellent performance.

Because of our climate, our resources, our shipping facilities by land and sea, the Pacific Coast states have suddenly become strategically important to American victory.

We have been busy in all our plants. We have been finding new ways to make old things, and applying old ways to making new things. . . . We are meeting the challenge of training new men and women to replace those who have changed their working clothes for uniforms. Let us look at a picture of our industrial growth and be proud.

The Lush Days of 1929

• Most of you remember the lush days of 1929. We thought those were prosperous days, days of plenty. They were a prologue and we are still in the first act.



J. D. ZELLERBACH, Our Job is to Produce for War

According to a very recent report of the Twelfth Federal Reserve Bank District, we have more than doubled our steel ingot production since 1929.

We have always thought our agricultural industry was large, but since 1929 our output of canned vegetables has also been doubled.

Production of forest products has expanded sensationaly. Since 1929 we have increased our production of paper 34 per cent. Our production of pulp has increased 87 per cent.

We are spending nearly twice as much in the production of motion pictures.

Automobile assemblies, until curtailed, increased 51 per cent.

Cement production increased 47 per cent.

Canned fruits increased 33 per cent.

Our production of zinc increased 51 per cent.

Gold production increased 64 per cent.

Since 1929 our capacity to produce has likewise increased measurably in canned fish, meat products, sugar, flour, butter, cheese, wool, silver.

In the field of glass containers, we now produce 98 per cent more than in 1929.

Our Job Today

• Some of these industries doubtless will suffer in wartime. Others will expand more fantastically than ever before as we devote ourselves to production for victory.

Our job today, yours and mine, is to work first for war production and second to solidify our new found industrial strength. This I cannot emphasize too strongly. Let us be realistic. Hundreds of thousands of new jobs are being created in our West Coast states. Today there are more workers employed in aircraft production than in any other western industry. Before total plant capacity is attained, aircraft employment may reach 220,000. Shipbuilding firms will require at least 200,000 men and another deluge of ship orders may require even further expansion.

The mineral industry of the far West, as you know, is extremely diversified, and in a war in which the supply of raw material is really the only top on production, minerals become of prime importance.

In 1939 the United States produced less than 7 million pounds of magnesium—the newly important war material—then used largely in fireworks.

We planned to produce 400 million pounds before Pearl Harbor; that has now been doubled.

One Northern California plant now building will supply 16 per cent of total planned domestic capacity. Over 4,500 workers will be employed with an annual payroll of over 8 million dollars.

Another strategic metal of the far West is manganese. Rated as one of the most vital, heretofore we have imported 97 per cent of our domestic requirements. About 12½ pounds of manganese are needed for every ton of steel.

The ultimate Manganese program submitted by the Secretary of the Interior to the Senate in mid-February calls for a tremendous increase to meet the enormous requirements of the President's war production schedule. The quota set for the eight western states amounts to nearly 60 per cent of the total program—an other major contribution of the Pacific slope to the war effort and another basic industry for our post-war period.

With all the glamour of our new met-

als, we cannot forget the fundamental importance of iron and steel.

The largest single industrial development in the mountain states, resulting from the war effort, is the new iron and steel plant to be built in Utah, at a cost of from 126 to 135 million dollars—equal to the cost of Boulder Dam which was under construction for nearly five years.

In Southern California too, steel is coming to the fore. The new blast furnace and rolling mills under construction at Fontana are a major development.

Under the so-called Hauck ten-million ton steel expansion program, adopted by the SPAB on September 30th, 1941, 1,865,300 tons have been allocated to the West Coast, both as a concession to the strategic necessity and in order to make this area largely independent of Eastern mills—if we can be largely independent in war time, we can be largely independent in peace time, too.

Other Gigantic Developments

Now let's turn to aluminum. Aluminum is not a new metal. But aluminum in the quantities now desired and in the uses to which it is now being put is a new development. Aluminum reduction plants and rolling mills will dot our whole Pacific Coast area from Southern California to Washington, and our deposits nearby of alumite will easily supply all our requirements. One deposit alone is estimated to be large enough to sustain an annual production of 60 million pounds of aluminum.

Tungsten, formerly imported chiefly from China has become one of our urgent needs. Stimulated by our defense program, the United States is concentrating on increasing our tungsten production to a self-sustaining level. In the most recent year for which figures are complete, California produced far more than any other State, even taking the lead from Nevada.

Mercury, not alone used to test the temperature, but a necessity in ammunition making, is a Pacific Coast first—California, first in Production, Oregon second, and Nevada third.

Largest and richest of our sub-surface resources is petroleum. In petroleum, base of a thousand products, we have no need for concern. This is already one of the outstanding industries of the Pacific.

With so many of these fundamental raw materials of war beneath the surface—with our rich soil so abundant in agricultural goodness—and with our famed Pacific sunshine overhead, we have the requisites of everything needed. It must be, therefore, in the hands of our people to develop these advantages and use them for the utmost good of all.

However, our labor supply problem on the Pacific Coast is intricate and will not easily be solved. Workers in our defense industries alone on the Pacific Coast are expanding at the rate of some 65,000 per month.

It is estimated by some experts that defense employment alone in March exceeded by 55,000 the total number of persons working in all manufacturing industries in the three far western states in 1939.

Shipbuilding firms on the Pacific Coast have increased the number of their employees to well over 176,000. The new yards on the San Francisco Bay and at Vancouver, Washington, will require another 20,000 new workers.

Bright Side of Picture

• However, there is a bright side to this picture. Industry can make good use of the country's ample supply of woman workers—and as you know, the N.A.M. has urged equal opportunity for women workers.

Our training programs are whipping into shape fast and producing able employees.

Biggest bottleneck—if you want to call it that—is in the supervisory field. Nearly every manager I talk to is faced with this problem—and none is more critical—for the corporals and the sergeants of industry represent the management to the privates. And what these Non-Coms do in their managerial capacity has a great deal of effect on the morale and the efficiency of the workers as a whole.

We must, all of us, focus intelligent attention and planning on foreman training programs. Here too the N.A.M. has some valuable educational helps. It is a vital key to industrial success. Up grading can and must be done—but not without adequate training.

As we analyze our war job we recognize the superhuman task that lies immediately ahead. If we were to stop and think about it too often, perhaps we would be overwhelmed by its magnitude. But we in management today do not have time to stop and contemplate. We must meet our schedules without fail.

A Glance Ahead

• There is a measure of sacrifice in pointing out in these days that the old axiom stands—"It's an ill wind that blows

FIELD NOTES

SKIRT BOARDS

need not cut conveyor belt life.

Materials that wedge between a conveyor belt and skirt boards can gouge and otherwise damage the belt cover. Here is a safe way to build such skirting:

Place the skirting as close to the belt as possible without touching the carrying sides. Set them so that the space between the skirt board and the belt increases in the direction of belt travel, thus permitting pieces of material to work free rather than become wedged against the belt face.

You may add considerable operating life to your belts by checking installation against this approved design.

VICTORY before "VICTOR"

"Victor" has long been Pioneer's top brand...the finest in conveyor belts and hose. The fine grades of crude rubber used in its manufacture, however, now must serve ships, planes and tanks almost exclusively. Meanwhile, skillful blending of age-resisting chemicals with allowable rubber enables Pioneer to continue producing high grade mechanical rubber goods to emergency specifications. PIONEER RUBBER MILLS, 353 Sacramento St., San Francisco, Calif.

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no one good." For while our courageous boys are fighting in jungle and on sea, let us be frank to recognize that the capital being supplied this area for war industrial development probably would not, in the normal course of affairs, have been available for some 25 or even 50 years to come.

We in this area, are fortunate that this "ill wind" will leave behind it new, modern plants—newly developed resources—and additional "know how." We are fortunate that it finds the man power and the natural resources here that CAN be developed—to add new strength to the nation when it needs that strength most.

The assets I have reviewed in the war of production are making the Coast a vitally strategic area. But some day these resources may make the Coast a center of world industry and commerce. This is a distinct possibility. What such tremendous industrial developments are doing to this area is easy to see. Multiplied several times over these industrial undertakings in diversified areas are creating metropolises from villages. New homes, new schools, new stores—all these are required now. Many of them are makeshift for the present, but later on we trust makeshift will be transformed to permanent structure, built for permanent prosperity.

We will emerge from war with a capital structure vitalized with the millions of dollars that have been invested here.

But no matter how much we look forward to a peaceful and prosperous future let us remember that we have but one job today—to win this war. No matter how much we hope—no matter how strong our faith may be—victory is the

only medium by which we can translate this faith to fact.

And, to win we must have production, production and more production. Our battle line is the production line. Our weapon is the lathe, the forge, and the furnace.

The Job of Winning

Gentlemen, one day last week, officers and men and American warships and planes tied into the tough job of wiping out a Japanese fleet that was threatening our supply lines to the deep South Pacific.

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They tackled that job with one resolve—**TO WIN**.

The cost of the job didn't occur to them.

The sacrifices were taken in stride.

When the signal flags ordered all hands to battle stations there was no thought of self.

Commissioned officers and enlisted men went into battle knowing there would be American ships destroyed, American men killed.

Six thousand miles away from folks they loved, officers and men went into battle together without regard for their lives or the physical floating plans on which they serve. They were concerned about you and me and 130,000,000 other Americans. They resolved to give and take and win so that American men and women and children would always be able to walk free. And when they emerged from that battle, **victorious**, they were depending that we had ready for them the tools for replacement so that they could fight again.

Gentlemen, that's the attitude that we, on the production line must develop—now.

Everywhere we turn opportunity stands before us to speed the battle of production. As we analyze our war job, let us take these opportunities and convert them to faster and better production to shorten the war. Let us convert new ideas to better weapons, better steel, to forge the victory that must be ours.

Let us coordinate and cooperate.

Let us pledge that management on the Pacific Coast shall lead the way in constructive thinking—in sure, fast, efficient production that will win this war—so that, having won the war, we can plan for prosperity in posterity.



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- (2) RURAL ELECTRIFICATION
- (3) ELECTRIC WATER HEATING

Puget power is proud of these three awards for what they represent—outstanding efficiency in customer service and a genuine contribution to the community life of this Northwest area.

**PUGET SOUND POWER
AND LIGHT COMPANY**

Photo Electric Side Register Control

As adapted to web operated machines such as slitters, winders, web printing presses, coaters and waxers.

by H. E. OVERACKER*

THE use of Electric Eye Side Register Control, or technically, Electronic Side Register Control on roll converting machines, is a natural outgrowth of the advances made in recent years by the Cameron Machine Company in web tension control. Originally the goal with regard to web tension control was to improve the operation of roll-winding machines by providing a constant tension on the web thus eliminating the need for the operator to adjust the friction on the mill roll brake with variations in the speed of the machine or the diameter of the mill roll. The results obtained by use of the constant web tension control were excellent. Without the attention of the operator, the friction adjustment on the mill roll brake was controlled by the web itself from the start to the finish of the run, while the rewound rolls produced were of even density from the core out.

From the successful application of constant web tension control to rewinders of narrow width, the use of this equipment spread to heavy duty rewinders in paper mills and also to web-operated printing presses and other machinery operated from the roll. Such equipment in appropriate design is now being used on rewinders ranging in width from 21 inches to 213 inches and on web fed presses such as Chambon, Heinrich, Kidder, Meisel, New Era, Webendorfer, and also Waldron and Shartle-Bevis waxers, Potdevin bag machines and other special applications.

When constant web tension control was applied to web printing presses, there was a noticeable improvement in lengthwise register and that in turn brought up the question of what to do about improving crosswise register, when presses were forced to operate with an unevenly wound or telescoped mill roll.

Prior to the advent of constant web tension control, attempts to control side register with the electric eye were meaningless, so long as the tension on the web was variable.

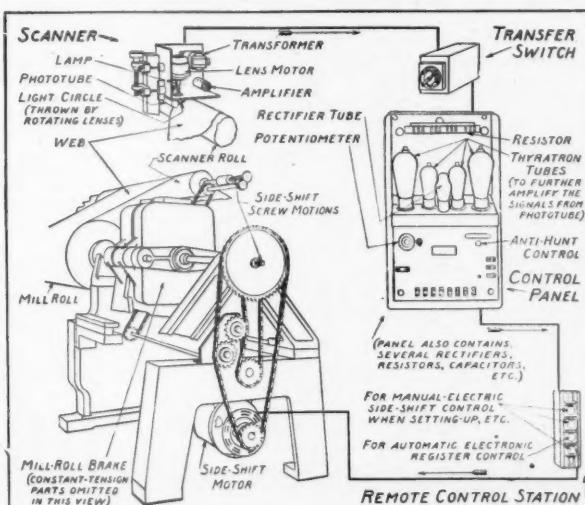
Engineers interested in electronic application to side register on equipment operating from the roll were quick to see that constant web tension control was the means by which photo electric side register control could be made practical.

A complete description of constant web tension control will be found in various paper and printing trade journals as indicated below.* For the purpose of a comprehension of this article it is sufficient to know that a constant web tension control consists essentially of a floating roll riding in a horizontal rack and connected through levers, or levers and gears, to the friction brake on the mill roll. The web is threaded through the machine so that pull is exerted on this floating roll. If the pull is heavy, the brake friction is relieved and when the pull is light then more friction is applied to the mill roll brake. By means of counterweighting, the floating roll can be adjusted for any grade of paper or any prac-

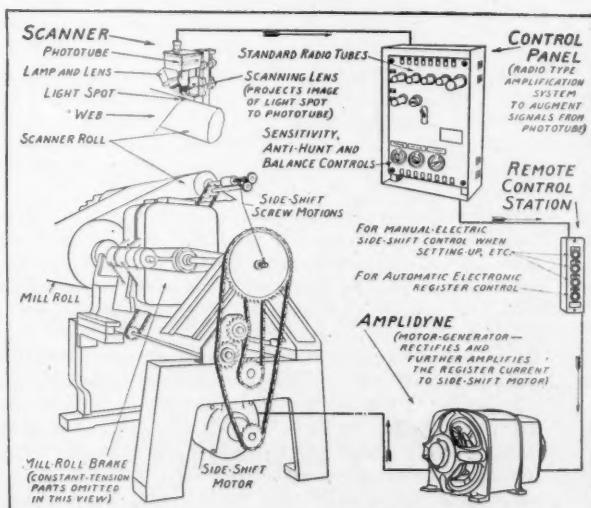
tical degree of tension. In actual operation the control is very sensitive and the roll does not float far in either direction.

We now come to the integration of the photo electric side register control with constant web tension control.

Essentially photo electric side register control apparatus consists of scanning head containing a light source from which the light is projected onto the edge of the web or a printed guide line in the form of a circle



Rotary-Lens Type Electronic Side Register Control as fitted to a light duty air-cooled Constant Tension.



Focusing-Lens Type Electronic Side Register Control as fitted to a heavy duty water-cooled Constant Tension.

*Cameron Machine Company, Brooklyn, N.Y. The Cameron Machine Company is represented on the Pacific Coast by the Pacific Coast Supply Company with offices in Portland and San Francisco.

PACIFIC PULP & PAPER INDUSTRY

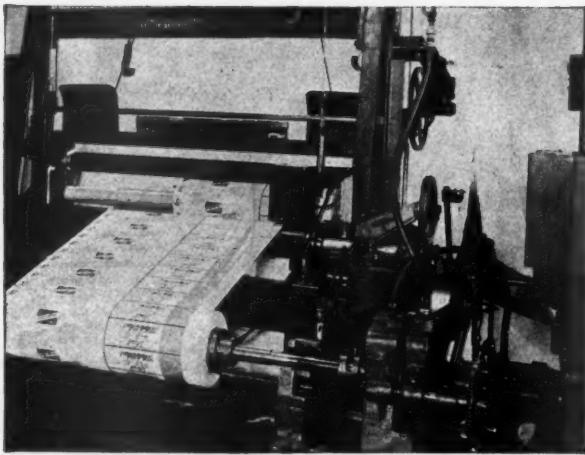
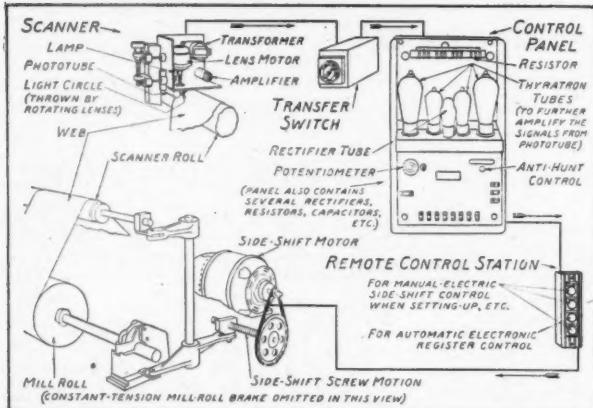


Photo-Electric Side Register Control as used with fast running slitter and rewinder in waxing plant.



Rotary-Lens Type Electronic Side Register Control as fitted to a heavy duty water-cooled Constant Tension.

or as in one type, concentric circles.

The scanning head contains, in addition to the light source, the photo electric cell which is activated by the amount of light reflected from the web. The idea, of course, is to keep the web running true at a constant point underneath the photo electric cell or "eye." When the web is running true, it bisects the circle of reflected light. What the "eye" therefore "sees" is a circle, half of which is bright (because of light reflected from the web) and half of which is dark (because of absorption of light by dark rubber idler roll over which the web passes).

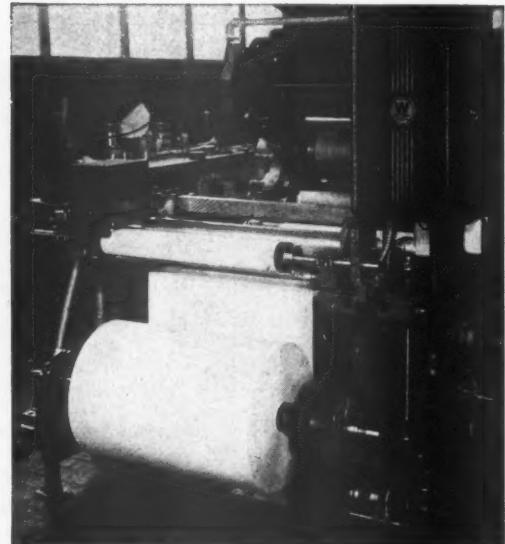
Suppose, however, that because of unevenly wound or "telescoped" roll, there is a tendency of the web to shift sidewise—immediately there is a change in the proportion between the dark and light areas of the circle and reflected light, which is detected by the photo electric cell. As is well-known, the photo cell is light-sensitive, and changes its resistance depending on the intensity of the light it absorbs. This change in resistance sets up a voltage differential in regulator tubes which are electrically connected to the photo electric cell. The tubes, in turn, operate an auxiliary motor which shifts the entire mill roll sidewise to compensate for any uneven winding of the original roll.

The photo-electric cell operates on a 60-cycle current, therefore, there are 120 voltage impulses a second available to correct off-register.

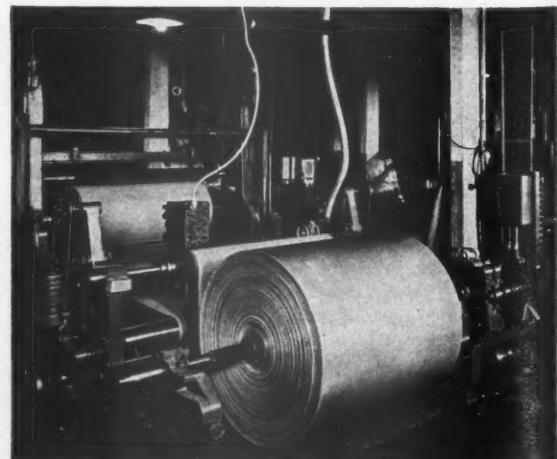
The photo electric side register control is built in different types for use with slitting machines in paper waxing plants where speeds are up to 1,500 f.p.m. as well as for use on multi-color presses, coating machines, waxes and other roll-operated equipment which run at somewhat slower speeds.

In general, it can be said that the photo electric side register control will make full correction at the rate of 25 inches of side traverse a minute.

There is at least one instance on record of the use of a photo electric side register control in connection with a slitter handling a printed web where the control proved to be more accurate than the printing plates. This was determined by purposely leaving the register marks on the slit strip. In this particular case there were seven repetitions of the design around the printing cylinder. Checking up on the register marks it was found that every seventh register mark was exactly the



New Era press equipped with Photo-Electric Side Register Control.



Fast running gummed tape slitter equipped with Photo Electric Side Register Control.

same distance from the edge of the web whereas those in between varied slightly on the distance from the edge because of imperfection in the printing plates.

It will be seen from the above that side register control is the main benefit derived from the "electric eye" when used on web printing presses.

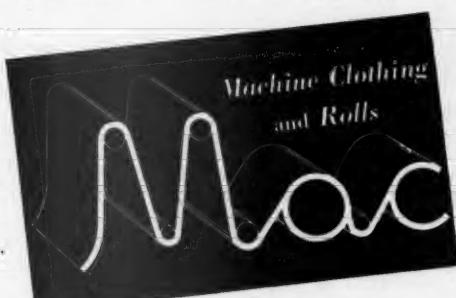
When the "electric eye" is applied to slitting and roll-winding machines the idea is to avoid trim waste by taking unevenly wound rolls and winding them into rolls with straight ends. When narrow strip is being slit this may mean the saving of one or more complete coils in a set. On expensive materials, in particular, this can run up into a considerable saving.

*Paper Trade Journal, August 18, 1938; Printing Equipment Engineer, November, 1938; Fibre Containers, January, 1939; Papier-Zeitung, May, 1939.

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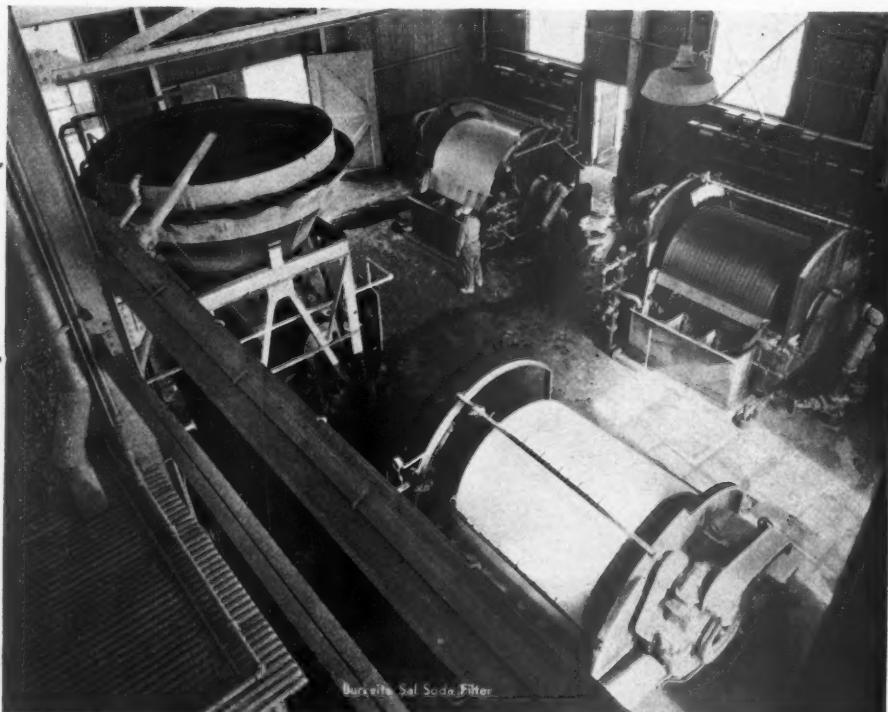


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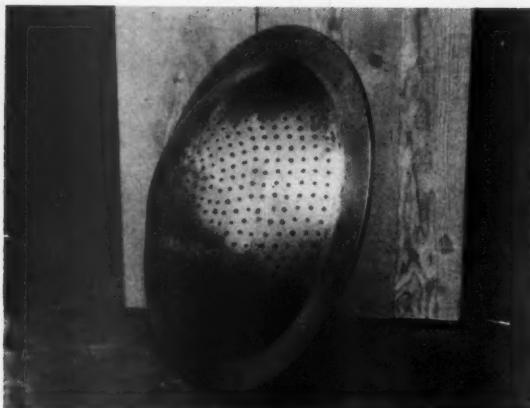
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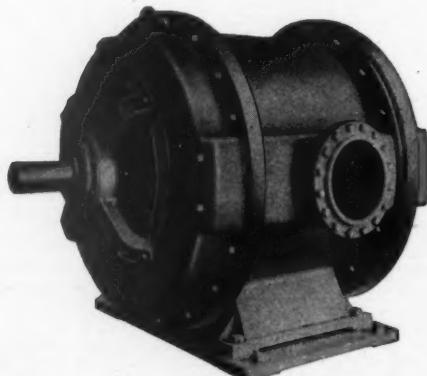
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